INSTITUTE OF GAS TECHNOLOGY

THE GAS INDUSTRY'S OWN EDUCATIONAL AND RESEARCH FACILITY

CHICAGO 16, ILLINOIS

GAS ABSTRACTS

VOLUME 11

1955

AFFILIATED WITH

ILLINOIS INSTITUTE OF TECHNOLOGY

Gas Abstracts is published and distributed monthly by the Institute of Gas Technology. The current technical literature is reviewed and articles pertaining to the Gas Industry are abstracted. These abstracts are grouped by subject and arranged alphabetically in each group. The thirteen groupings are presented below—

Contents

1. Gas Industry—General information and news items, statistics, business regulations, and other articles of general interest.
2. Appliances—Burners, ranges, cooking equipment, air conditioning equipment, water heaters and other gas appliances for domestic and commercial use.
3. Combustion and Industrial Furnaces—Combustion of gaseous, liquid and solid fuels; design of industrial furnaces; control of furnace atmospheres.
4. Carbonization and Gasification—Manufacture and purification of producer gas, blue gas, carburetted water gas, synthetis gas; carbonization and gasification of coal; and gasification of oil.
5. Natural Gas and Natural Gas Condensates—Production, transmission, distribution and storage of natural gas and natural gas condensates; distribution of LP-gas mixtures; carbon black and chemicals from natural gas and natural gas condensates.
6. Petroleum and Synthetic Liquid Fuels—Production, refining, cracking, alkylation, isomerization, and utilization of petroleum and production of synthetic liquid fuels by the Fischer-Tropsch reaction and hydrogenation.
7. Analytical Methods and Tests—New and improved methods pertaining to gas making materials, processes, products, and by-products.
8. General and Physical Chemistry—Data on chemical and physical properties of elements and inorganic compounds; new reactions; and methods for carrying out established reactions.
9. Organic Chemistry—Data on organic compounds closely related to the Gas Industry; new reactions; new methods.
10. Chemical Engineering—Data and methods for fluid flow, heat transfer, and unit operations of distillation, evaporation, extraction, drying, and filtration.
11. Process Equipment and Instrumentation—Information on new equipment for process operations and process control.
12. Materials of Construction—New developments in refractories, heat and corrosion resistant materials, new alloys applicable to the Gas Industry, and other materials of construction.
13. New Books—Recent books pertaining to the field of gas technology.

The Institute of Gas Technology was founded in 1941 by members of the Manufactured and Natural Gas Industry to accomplish the following objectives:

1. *To train personnel for the Gas Industry.*
2. *To collect and disseminate scientific information of interest to the Gas Industry.*
3. *To prosecute fundamental and applied research for the Gas Industry.*
4. *To stimulate and correlate research within the Gas Industry.*

Inquiries may be addressed to:

THE DIRECTOR
Institute of Gas Technology
17 West 34th Street
TECHNOLOGY CENTER
Chicago 16, Illinois

INSTITUTE OF GAS TECHNOLOGY

THE GAS INDUSTRY'S OWN EDUCATIONAL AND RESEARCH FACILITY

CHICAGO 16, ILLINOIS

GAS ABSTRACTS INDEX

VOLUME 11 1955

AFFILIATED WITH

ILLINOIS INSTITUTE OF TECHNOLOGY

AUTHOR INDEX

A

Abell, C. WHEN YOU MUST FIGHT ARRANGE TO WIN 1;—UNDERGROUND STORAGE — OUR INSURANCE AGAINST COLD CUSTOMERS 66;—AGRICULTURAL FLAMING IS A FAST-GROWING NEW MARKET FOR LPG 105

Abraham, E. D. and McClure, G. M. HOW STRESSES AFFECT BRANCH CONNECTION 89

Abram, J. C. AN INTRODUCTION TO CERAMIC ARTWARE MANUFACTURE 61; — SOLUTION TANKS PROVIDE YEAR-ROUND MARKET ACROSS THE COUNTRY 82;—METAL MELTING OPERATIONS OFFER THE LPG DEALER LARGE SALES POTENTIAL 105; 123

Ackermann, P. See Koelbel, H.

Acrivos, A. and Amundson, N. R. ON THE STEADY STATE FRACTIONATION OF MULTI-COMPONENT AND COMPLEX MIXTURES IN AN IDEAL CASCADE. PART IV: THE CALCULATION OF THE MINIMUM REFLUX RATIO. 206

Adams, C. I. and Spaulding, G. H. DETERMINATION OF ORGANIC NITROGEN BY KJELDAHL METHOD WITHOUT DISTILLATION 149

Adams, E. NATURAL GAS RISES WITH THE SOUTH 158

Adams, K. S. WILL GAS UTILITIES SIT IDLY BY? 17

Aerogen Company Ltd. See Dean, P. W.

Aerzener Maschinen Fabrik G. m. b. H. See Grote, P.

Agnich, F. J. GEOPHYSICAL INSTRUMENTATION IS MAKING RAPID PROGRESS 181

Agnon, S. E. and Spurlock, B. H. Jr. PSYCHROMETRIC ANALYSIS FOR DESIGN OF FORCED DRAFT AIR COOLING TOWERS 185

Akerman, J. R., Farber, E. A., and Larson, G. L. COMBUSTION EFFICIENCY-CYCLE LENGTH OF DOMESTIC OIL BURNERS 174

Akers, W. W., Burn, J. F., and Fairchild, W. R. LOW TEMPERATURE PHASE EQUILIBRIA: METHANE-PROPANE SYSTEM 95;—Kelley, R. E., and Lipscomb, T. G. CARBON DIOXIDE-PROPANE SYSTEM 95;—Kehn, D. M., and Kilgore, C. H. VOLUMETRIC AND PHASE BEHAVIOR OF NITROGEN-HYDROCARBON SYSTEMS: NITROGEN-n-HEPTANE SYSTEM 96; — Attwell, L. L. and Robinson, J. A. NITROGEN-BUTANE SYSTEM 96

Aktiebolaget Elektrolux See Koegel, W. G.

Alexander, C. See Palmer, G. H.

Alexander, L. G., Baron, T. and Comings, E. W. TRANSPORT OF MOMENTUM, MASS, AND HEAT IN TURBULENT JETS 34

Alford, E. C. PUTTING NEW LIFE INTO DEAD RECORDS PROGRAM 173

Allan, G. W. PROGRESS REVIEW NO. 35: DEVELOPMENTS IN GAS-PRODUCER PRACTICE 216

Allbright, C. S. See Dinneen

Allen, H. CORROSION PROTECTION A CONTINUOUS JOB 115

Allied Chem. and Dye Corp. See Voelker, J. G.

Almquist, W. E. See Hazlett, R. H.

Alorfer, H. A. LUBRICATED PLUG VALVES 76

Aluminum Lab. Ltd. See Hartwick, E. F.

Ambrose, E. R. AG & E EXPERIENCE PROVES COMMERCIAL HEAT PUMPS PRACTICAL 174

American Cyanamid Co. See Fugate, W. O.

American Gas Association GAS RESERVES AT HIGH LEVEL 101; — GAS HEATING TO INCREASE 102; — TEST NEW TOP BURNER CONTROLS 190; — WHAT'S THE SCORE? COSTS OF GAS VERSUS ELECTRICITY IN COMMERCIAL KITCHENS 210; — RECOMMENDED PIPING ON INDUSTRIAL PREMISES 210

American Petroleum Institute NITROGEN COMPOUNDS IN PETROLEUM 50; API TUBULAR GOODS STANDARDS REVIEWED 109; TENTATIVE STANDARD FOR FIELD WELDING OF PIPE LINES 108

American Society of Mechanical Engineers GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEMS 89

American Standards Association COMMITTEE ACTS ON 14 STANDARDS 118

American Wheelabrator and Equipment Corp. See Pring, R. T.

Amundson, N. R. ON THE STEADY STATE FRACTIONATION OF MULTICOMPONENT AND COMPLEX MIXTURES IN AN IDEAL CASCADE. PART III. DISCUSSION OF THE NUMERICAL METHOD OF CALCULATION 206 See Acrivos, A.

Anderson, H. C., Wiley, J. L. and Newell, A. BIBLIOGRAPHY OF THE FISCHER-TROPSCH SYNTHESIS AND RELATED PROCESSES: I REVIEW AND COMPILATION OF THE LITERATURE ON THE PRODUCTION OF SYNTHETIC LIQUID FUELS AND CHEMICALS BY THE HYDROGENATION OF CARBON MONOXIDE: II PATENTS 201

Andrews, R. V. SOLVING CONDUCTIVE HEAT TRANSFER PROBLEMS WITH ELECTRICAL-ANALOGUE SHAPE FACTORS 97

Anglo-Iranian Oil Co., Ltd. See Porter, F. W.

Anthes, J. F. RESEARCH ON INTERCHANGEABILITY OF FUEL GASES IN THE UNITED STATES 217

Anthoney, W. R. See Dinneen, G. U.

Anuskiewicz, M., Jr. METHODS TO PREVENT OVERPRESSURE IN DISTRIBUTION SYSTEMS 129

Arden, T. T. GAS APPLIANCE OUTLOOK 38; See Caparone, M. J.

Armstrong, G. T. VAPOR PRESSURE OF NITROGEN 52;—Brickwedde, F. G. and Scott, R. B. VAPOR PRESSURES OF THE METHANES 204

Armstrong, J. A. and White, H. J. HIGH EFFICIENCY HIGH VELOCITY ELECTROSTATIC AIR CLEANER 185

Arnoff, E. L. THE APPLICATION OF LINEAR PROGRAMMING TO PRODUCTION ENGINEERING AND SCHEDULING 183

Aronofsky, J. S. See Jenkins, R.

Arps, J. J. HOW WELL COMPLETION DAMAGE CAN BE DETERMINED GRAPHICALLY 181

Arthur, J. R. and Raftery, M. M. THE SLOW COMBUSTION OF SOLID FUELS 41

Asahi Chemical Industry Co., Ltd. See Munekata, E.

Ashby, C. T. and Miller, C. A. ABSORPTION REFRIGERATION 190

Ashley, C. M. AIR CONDITIONING NOISE CONTROL—GOOD? BAD?—OR DIFFERENT? 102

Atlantic Refining Co. See Rieve, R. W.

Attaway, C. D. A PORTABLE FULL-SCALE TESTER FOR HIGH-PRESSURE GAS CONDENSATE WELLS 8

Attwell, L. L. See Akers, W. W.

B

Babcock & Wilcox Co. See Bailey, E. G.; See Sifrin, A.

Bachmann, G. K. ECONOMICS OF A PLANNED METER RETIREMENT PROGRAM 66; AUTOMATIC METER PROVING DEVICES 128

Badische Anilin- und Soda-Fabrik A. G. See Sachsse, H.

Baehr, J. GASENTSCHWEFELUNG DURCH SELEK-

TIV-KURZWAESCHE MITTELS AMMONIA-KLOESUNGEN UND VERARBEITUNG DES SCHWEFELWASSERSTOFFS AUF SCHWEFEL ODER AMMONSULFAT (GAS DESULFURIZATION BY SELECTIVE SHORT-CONTACT SCRUBBING WITH AMMONIA SOLUTIONS AND PROCESSING THE HYDROGEN SULFIDE TO SULFUR OR AMMONIUM SULFATE 125
Bailey, E. G., and Hardgrove, R. M. PROCESS FOR THE THERMAL CONVERSION OF LIQUID AND GASEOUS HYDROCARBONS 84
Bailey, G. B. and Lorenzi, R. J. THE VALANCE HEATING AND COOLING SYSTEM 103
Bailey, R. W. ZINC COATINGS ON STEEL 207
Bair, W. G. See Linden, H. R.
Baird, R. C. NOISE-CONTROLLED COMPRESSOR STATION WITHIN A RESIDENTIAL AREA 179;—WIND-INDUCED VIBRATION OF A PIPE-LINE SUSPENSION BRIDGE, AND ITS CURE 200
Baker, M. J. See Gabourel, J. D.
Baker, O. and Swerdloff, W. SPEED UP FLOW CALCULATIONS FOR DESIGN OF GAS-GATHERING SYSTEMS 146
Balekjian, G. See Katz, D. L.
Balka, W. H. NEW DRY-FURNACE CARBON-BLACK PROCESS 126
Ball, A. F. See Douglas, T. B.
Ballard, S. A., Finch, H. De V. and Peterson, E. A. SYNTHESIS OF UNSATURATED HYDROCARBONS FROM UNSATURATED KETONES 32
Banks, F. M. THE GAS INDUSTRY IN 1955 57;—WANTED: INDUSTRY COORDINATION 209
Bannister, H. and Whelan, P. F. THE JACOBY CONVEYOR AS A SOLIDS FEEDER 135
Bardwell, J. See Shu, N. W.
Barker, J. E., Mott, R. A. and Thomas, W. C. STUDIES IN BOMB CALORIMETRY IV—CORRECTIONS 202
Barker, L. See Blackburn, W. H.
Barnett, P. R. See Bloom, H.
Barney, J. E. II. DETERMINING TRACE METALS IN PETROLEUM DISTILLATES. AN ACID-EXTRACTION TECHNIQUE 204;—and Haight, G. P. Jr. EFFICIENCY OF RECOVERY METHODS 204
Baron, T. See Alexander, L. G.
Barr, F. T. and Jahnig, C. E. FLUID COKING AND FLUID COKE 130
Barrett, J. P. and Gould, E. D. CATHODIC PROTECTION FOR OIL-WELL CASING 198
Barthauer, G. L. IMPROVED PLASTOMETER FOR STUDYING AGGLUTINATING BEHAVIOR OF CAKING COAL 177
Bartholomé, E. THE BASF PROCESS FOR PRODUCTION OF ACETYLENE BY PARTIAL OXIDATION OF GASEOUS HYDROCARBONS 184
Barton, H. M., Jr. SEPARATION OF GASES BY DIFFUSION 135
Barusch, M. R., Payne, J. Q. and Neu, J. T. PROCESS FOR PRODUCING UNSATURATED HYDROCARBONS AND OXYGEN COMPOUNDS OF HYDROCARBONS BY OXIDIZING HYDROCARBON GASES 134
Bass, D. M. and Crawford, P. PREDICTING RESERVOIR PERFORMANCE 165
Batchelder, H. R. and Busche, R. M. KINETICS OF COAL GASIFICATION 62;—and Hirst, L. L. COAL GASIFICATION AT LOUISIANA, MISSOURI 195
Battelle Development Corp. See Munger, H. P.
Battersby, T. C. and Braunholtz, W. T. UNUSUAL INCIDENTS AT GAS WORKS AND THEIR LESSONS 212
Baum, K. CONTINUOUS COKING PROCESS PROMISES LOW COST PRODUCTION 43
Beadle, D. G. PHOTOELECTRIC APPARATUS FOR ASSESSING DUST SAMPLE 29
Beamish, J. C. HOW MILWAUKEE GAS "JOB TESTS" ITS EMPLOYEES 77
Bean, H. S. A POUND OF GAS? 46
Bearer, L. C. MEANS AND METHOD FOR PRODUCING FUEL GAS 215
Beck, C. V. COMPARATIVE EFFICIENCIES, COAL, OIL, GAS 4
Beebee, A. M. ARE PUBLIC POWER PROGRAMS IN THE PUBLIC INTEREST? 101
Beecherl, L. A., Jr. CONDENSATE EXTRACTION FROM LEAN GAS 46
Beemsterboer, P. B. See Laube, H. L.
Beggs, D. DRY NITROGEN-BASE PREPARED ATMOSPHERES 104;—GAS GENERATOR AND PROCESS FOR PRODUCING DRY GAS 186
Behr, P. G. PROTECTING DISTRIBUTION STRUCTURES 162
Belcher, R. and Spooner, C. E. SOME NOTES ON THE RAPID METHOD FOR THE SIMULTANEOUS DETERMINATION OF SULFUR AND CHLORINE IN COALS AND COKES 132
Bell, A. H. FRACTURING REJUVENATES ILLINOIS PRODUCTION 145
Bell, F. S. See Huebotter, E. E.
Benington, F. See Poirier, R. H.
Benjamin, A. D. A SIMPLIFIED METHOD FOR MAINTAINING CONSTANT RELATIVE HUMIDITY 139
Bennett, A. R. and Reichert, H. DISPOSAL OF PRODUCTS OF COMBUSTION FROM GAS APPLIANCES 38
Benson, H. E., Field, H. H., Bienstock, D., and Storch, H. H. OIL CIRCULATION PROCESS FOR FISCHER-TROPSCH SYNTHESIS 10
Benz, G. R., Tucker, P. W. and De Voe, W. F. L.P.G. RECORDS FALL AGAIN IN '54 47
Berg, C. DESIGN OF PROCESS SYSTEMS UTILIZING MOVING BEDS 186
Bergman, W. E. See Poettmann, F. H.
Berkowitz, N. PHYSICOCHEMICAL STUDIES ON ALBERTA COALS 124;—PHYSICOCHEMICAL STUDIES ON ALBERTA COALS II 212
Berl, W. G., Rice, J. L. and Rosen, P. FLAMES IN TURBULENT STREAMS 176
Berlad, A. L. FLAME QUENCHING BY A VARIABLE-WIDTH RECTANGULAR-CHANNEL BURNER AS A FUNCTION OF PRESSURE FOR VARIOUS PROPANE-OXYGEN-NITROGEN MIXTURES 30
Bertuzzi, A. F. See Davis, P. C.
Besselman, W. L. INSTRUMENTATION FOR ATMOSPHERE ANALYSIS AND CONTROL 171
Betts, G. G. STEAM JET REFRIGERATION 190
Beutler, J. A. PROGRAMMING OF KINETIC CALCULATIONS FOR AUTOMATIC COMPUTATION 75
Bewley, T., Bowen, B. E., Bramyche, P. L., Jackson, G. W. MANUFACTURE OF PHENOL U. S. 224
Bien, W. GASMEN CHALLENGE HEATING CLAIMS OF OIL INDUSTRY 39
Bienstock, D. See Benson, H. E.
Bigeleisen, J. See Leigh, C. H.
Biles, W. R. See Rose, A.
Bills, J. L. ACETYLENE MANUFACTURE 96;—PRODUCTION OF ACETYLENE 205
Binder, R. C. See Thrasher, L. W.
Birchenall, C. E. See Juenker, D. W.
Bischofsberger, G. T. See Charette, L. P.
Bissell, W. E. REPAIR COUPLING WITH TEMPORARY AND PERMANENT SEALS 67
Bissey, L. T. and Villarreal, J. F. NATURAL GAS PIPELINE DEPOSITS 89;—GAS PIPE LINE DEPOSITS—CAUSES AND CURES 129
Bituminous Coal Research, Inc. See Yellott, J. I.
Bjoernerud, E. K. See Penner, S. S.
Black, J. F. and Smith, C. D. CORRELATION OF CRUDE OILS 92
Blackburn, W. H., Barker and Catchpole, J. R. AN

INVESTIGATION INTO THE COMPOSITION OF AMMONIACAL LIQUOR I.—CONTINUOUS VERTICAL RETORT 49
Blanding, F. H. See Smith, L. B.
Blohm, C. L. and Riesenfeld, F. G. AMINO-ETHER GAS TREATING PROCESS 199
Blom, L. and Edelhausen, L. DIRECT TITRATION OF CARBON DIOXIDE 203
Bloom, H. and Barnett, P. R. A NEW CERAMIC BUCKBOARD AND MULLER 149
Bloomer, O. T., Eakin, B. E., Ellington, R. T. and Gami, D. C. THERMODYNAMIC PROPERTIES OF METHANE-NITROGEN MIXTURES 95
Blossom, E. D. See Menard, H.
Bluemner, E. CHEMICAL MODIFICATION OF COAL INTO HYDROCARBON OILS AND COKE 178
Bobo, R. A., Ormsby, G. S., and Hoch, R. S. PHILLIPS TESTS AIR-MUD DRILLING PART II 86;—KEYS TO SUCCESSFUL COMPETITIVE DRILLING 107
Bodine, A. G., Jr. SONIC EARTH BORING DRILL WITH SELF-RESONATING VIBRATION GENERATION 180
Boggs, H. D. and Longenecker, D. R. TECHNIQUES DEVELOPED IN TESTING REINFORCED POLYESTER PIPE 188
Boggs, J. H., Fitch, E. C. and Woods, A. T. PUMPS 15
Bogumill, T. R. A UTILITY ACCEPTS PLASTIC PIPE FOR SERVICE RENEWALS 89
Boll, M. W. See Pilling, A. H.
Bolt, J. A. See Tom, T. B.
Bolz, R. E. and Burlage, H., Jr. THE INFLUENCE OF TURBULENCE ON FLAME PROPAGATION RATES 159
Bond, R. L. and Murnaghan, A. R. SURFACE DIFFUSION 30
Bonilla, C. F., Tarmy, B. L., and Lee, C. S. THE MEASUREMENT OF THE THERMAL CONDUCTIVITY OF GASES AT HIGH TEMPERATURE 223; See Weidenbaum, S. S.
Bonnaud, H. PUMPING PLANT FOR LIQUEFIED GAS 135
Bono, T. J. COMPRESSED AIR SAVES DRILLING DOLLARS 86
Bonvillian, C. A., Brierly, R. C. and Latvin S. APPARATUS FOR THE COMBUSTION OF FUEL 79
Bookey, J. T. THE HANDLING AND STORAGE OF FUELS 41
Booth, A. D. SOME CURIOSITIES OF BINARY ARITHMETIC USEFUL IN TESTING BINARY COMPUTERS 207
Borch, N. S. METHOD AND APPARATUS FOR EXPELLING VOLATILE CONSTITUENTS FROM SOLID CARBONACEOUS FUEL 160
Bosch, Robert, G.m.b.H. See Zehender, E.
Bostock, W. APPARATUS FOR DETERMINING PARTICLE SIZE DISTRIBUTION 93
Botset, H. G. SECONDARY RECOVERY WATER FLOODING 90
Bottenberg, K. X. METHOD OF PREVENTING HYDROGEN SULFIDE HYDRATE FORMATION 9
Boudart, M. See Cimino, A.
Bowen, B. E. See Bewley, T.
Boyd, B. R. See Gillette, J. M.
Boyd, F. A. UNDERGROUND GAS STORAGE IN THE APPALACHIAN AREA 200
Boyd, G. M. THE EFFECTS OF RESIDUAL STRESSES IN WELDED STRUCTURES 188
Boyer, E. G. PRACTICE AND PROBLEMS IN THE USE OF NATURAL GAS, REFINERY OIL GAS AND LIQUIFIED PETROLEUM GAS IN GAS PRODUCTION 189
Boyer, L. H. MANUFACTURE OF ACETYLENE AND ETHYLENE 13
Boyle, J. R. DEW POINT MEASURING APPARATUS 155
Box, E. O., Jr. SELECTIVE REMOVAL OF ACETYLENE FROM ETHYLENE-CONTAINING GASES 52;—TREATMENT OF HYDROCARBON GASES CONTAINING ACETYLENE 205
Bradford, R. I. See Crawford, P. B.
Bradley, J. M. MANUFACTURE OF COKE FROM HYDROCARBONS 91
Brady, J. F. See Stevens, R. F.
Brady, J. H. See Buchoff, L. S.
Bragg, L. X-RAYS AND THE MOLECULE 223
Bramyche, P. L. See Bewley, T.
Brantly, M. M. and Smith, F. W. AIR DRILLING IS DEVELOPING RAPIDLY 197
Braunholtz, W. T. See Battersby, T. C.
Breen, J. M. PROBLEMS INVOLVED IN THE APPLICATION OF ELECTRONIC DIGITAL COMPUTERS TO BUSINESS OPERATIONS 183
Bretz, G. M. See Farnsworth, J. F.
Brickwedde, F. G. See Armstrong, G. T.
Bridgeman, O. C. THE 10 PER CENT SLOPE 167
Brien, E. B. MOLECULAR "SIEVES" OFFER NEW SEPARATION PROCESS 113
Brierly, R. C. See Bonvillian, C. A.
Brimley, D. E. See Eggleston, G. E.
British Petroleum Co., Ltd. See Porter, F. W.
Broaddus, J. E., Morse, A. J., and Huntington, R. L. HOW TO DRAIN BUBBLE-CAP COLUMNS 114
Broadley, P. R. See Yellott, J. I.
Brockwell, P. A. HOW TO SPEED UP GAS PURCHASE ACCOUNTING 77
Brombacher, W. G. and Lashof, T. W. BIBLIOGRAPHY AND INDEX ON DYNAMIC PRESSURE MEASUREMENT 113
Bromell, R. J. STRAIGHT HOLE DRILLING 107
Bromley, L. A. See Rothman, A. J.
Brooks, T. P., O'Quinn, P. C., and Life, W. E. FRACTURING AT HIGH INJECTION RATES, SPRABERRY TREND AREA FIELD 163
Brooks, W. B. SEAWATER AS AN INDUSTRIAL COOLANT: EQUIPMENT EXPERIENCE 35
Brown, D. SOUTH SEES INCREASED USAGE OF L.P. GAS FOR COTTON CULTIVATION 159
Brown, J. K. INFRARED STUDIES OF CARBONISED COALS 124;—and Wyss, W. F. OXYGEN GROUPS IN BRIGHT COALS 213
Brown, J. W. See Burnside, H. E.
Brown, L. S. METALLIC RECUPERATORS 155
Brown, R. A. See Melpolder, F. W.
Brundred, L. L. and Brundred, L. L., Jr. ECONOMICS OF WATER FLOODING 69
Buchberg, H. ELECTRIC ANALOGUE PREDICTION OF THE THERMAL BEHAVIOR OF AN INHABITABLE ENCLOSURE 138
Buchoff, L. S., Ingber, N. M., and Brady, J. H. COLORIMETRIC DETERMINATION OF LOW CONCENTRATIONS OF DISSOLVED OXYGEN IN WATER 221
Buckham, J. A. and Moulton, R. W. SPRAY DRYING 114
Buckingham, A. D. and Pople, J. A. THE STATISTICAL MECHANICS OF IMPERFECT POLAR GASES. PART I—SECOND VIRIAL COEFFICENTS 219
Buckhingam, E. NOTES ON SOME RECENTLY PUBLISHED EXPERIMENTS ON ORIFICE METERS 75
Buckland, B. O. CORROSION AND DEPOSIT IN GAS TURBINES 28
Buckwalter, J. F. INJECTION RATES TELL BOTTOM-HOLE STORY 110
Buehl. R. C. and Royer, M. B. SMELTING IRON ORE WITH ANTRACITE; BUREAU OF MINES EXPERIMENTAL BLAST FURNACE 192
Buell, C. K. and Clark, A. MANUFACTURE OF HYDROGEN 126
Buell, E. H. See Mundth, L. K.
Buell, K. THE ROLE OF COMMERCIAL BANKS IN GAS INDUSTRY FINANCING 58

Bukowiecki, A. A SURVEY OF CORROSION INHIBITORS 35
Bundy, F. P. See Strong, H. M.
Bunnell, F. H. PLASTIC PIPE IS GAINING APPROVAL 26
Burke, W. C. See Rochow, W. F.
Burlage, H., Jr. See Bolz, R. E.
Burnhart, V. N. LOWER DIAMOND DRILLING COSTS WITH WIRE-LINE CORE BARREL 162
Burns, J. F. See Akers, W. W.
Burnside, H. E., and Brown, J. W. CYCLONE SEPARATOR FOR SEPARATING SOLID PARTICLES FROM GASIFORM MIXTURES 62
Burrows, D. B. See Carr, N. L.
Burt, E. A. ADVANTAGES OF AUTOMATIC CHANGEOVER 104
Burt, R. B. CONVERSION FROM COKE TO NATURAL GAS AS RAW MATERIAL IN AMMONIA PRODUCTION 62
Burwell, E. B., Jr., and Nesbitt, R. H. BOREHOLE CAMERA IS MILESTONE IN SUBSURFACE EXPLORATION 55
Busche, R. M. See Batchelder, H. R.

C

Cabot, G. L. Inc. See Bradley, J. M.
Cabarcos, M. See Canjar, L. N.
Caldwell, D. L. A COMPLETE SYNTHETIC FERTILIZER PLANT 133
Calhoun, J. C., Jr. See Paez, J.
California Research Corp. See Barusch, M. R.; See Sieg, R. P.
Callear, A. B. and Robb, J. C. AN EXPERIMENTAL METHOD OF MEASURING THE THERMAL CONDUCTIVITY OF GASES 184
Cametti, B. and Mei, A. J. HERMETIC MOTOR PUMPS FOR SEALED SYSTEMS 187
Cammen, M. M. See Feaster, D. J.
Campbell, C. D. See Keller, J. E.
Campbell, H. S. A NATURAL INHIBITOR OF PITTING CORROSION OF COPPER IN TAPWATERS 56
Campbell, J. M. DEHYDRATION OF LIGHT HYDROCARBON LIQUIDS. PART I: DEHYDRATION METHODS 8;—PART II: REGENERATION METHODS AND DESIGN FACTORS 33;—ELEMENTS OF FIELD PROCESSING: PART I—KNOW YOUR SEPARATORS,—PART II—HOW PRESSURE AFFECTS OIL AND GAS SEPARATION 145;—PART III—HOW TEMPERATURE AFFECTS SEPARATION 162;—PART IV—HOW WELL-STREAM COMPOSITION AFFECTS DEGREE OF SEPARATION 162;—PART V—HANDLING OF SEPARATOR LIQUID—STAGE SEPARATION 145
Campbell, O. F. HERE'S MORE LIGHT ON (1) CO BOILERS AND (2) WASTE-GAS ELIMINATORS 190
Canfield, C. R. HERE'S A TOOL THAT LETS YOU SEE WHAT GOES ON BELOW 108
Canjar, L. N., Smith, R. R., Volianitis, E., Galluzzo, J. F. and Cabarcos, M. CORRELATION OF CONSTANTS IN THE BENEDICT-WEBB-RUBIN EQUATION OF STATE: n-PARAFFINS, 1-BUTENE AND 2,2-DIMETHYLPROPANE 169
Caparone, M. J. and Arden, T. T. SAFETY CONTROL AND IGNITION APPARATUS FOR GASEOUS FUEL BURNERS 3
Capell, R. G. See Karr, C., Jr.
Capper, H. THE USE OF GAS IN SUGAR CONFECTIONERY 4
Carpenter, P. G. SYSTEM FOR GAS ANALYSIS 49
Carr, N. L., Kobayashi, R. and Burrows, D. B. VISCOSITY OF HYDROCARBON GASES UNDER PRESSURE 12
Carroll, A. L. RESIDENTIAL HEATING OIL VS GAS 18;—GAS VS OIL IN WATER HEATING 80
Casper, J. C. and Reilly, J. BETTER TIMES AHEAD FOR L.P.G.? 164
Caswell, E. G. See Millard, B.
Catchpole, J. R. See Blackburn, W. H.
Catlin, J. P. See Clark, H. T.
Caudie, B. H., Erickson, R. A. and Slobod, R. L. THE ENCROACHMENT OF INJECTED FLUIDS BEYOND THE NORMAL WELL PATTERN 165
Caule, E. J. and McCully, G. AN AUTOMATIC RECORDING ANALYTICAL BALANCE 76
Cavigli, H. J. See Postlewaite, W. R. 99
Cawley, R. L. and Jones, J. H. METHANE DRAINAGE: AN ACCOUNT OF THE WORK CARRIED OUT AT HAIG PIT, WHITEHAVEN 194
Cerny, A. N. See Parmelee, G. V.
Chaberek, S. See Martell, A. E. 28
Chabre, G. HOW TO CONTROL FIRE DURING PIPE LINE TIE-INS 199
Chambers Corp. See Chambers, J. E.
Chambers, J. E. SUPPORT FOR TOP BURNERS 174
Chancellor, J. N., Jr. See Kennedy, F. G.
Chandler, M. OUTLOOK FOR GAS INDUSTRY 173
Chapman, F. W., Jr. See Sherwood, R. M.
Chapman, W. R. and Rhys Jones, D. C. THE REMOVAL OF SULFUR FROM COAL 106
Charette, L. P. and Bischofsberger, G. T. BINDERS FOR CARBON ELECTRODES IN THE ALUMINUM INDUSTRY 178
Chermin, H. A. See Van Krevelen, D. W.
Chervenak, M. C. See Pichler, H. R.
Childs, E. B. and Kanehann, J. A. APPLICATION OF THE LOGARITHMIC SECTOR TO QUANTITATIVE ANALYSIS OF PETROLEUM ASH RESIDUES 93
Chilton, E. G. and Handley, L. R. PULSATION ABSORBERS FOR RECIPROCATING PUMPS 99; See Oppenheim, A. K.
Chu, J. C. and Staffel, E. J. CORRELATION BETWEEN EQUILIBRIUM FLASH VAPORIZATION AND ASTM DISTILLATION DATA OF PETROLEUM MIXTURES 112
Cimino, A., Boudart, M. and Taylor, H. ETHANE HYDROGENATION-CRACKING ON IRON CATALYSTS WITH AND WITHOUT ALKALI 32
Cines, M. R. and Krejci, J. C. PROCESS OF PRODUCING INCREASED YIELDS OF TAR-FREE CARBON BLACK 216
Clark, A. See Buell, C. K.
Clark, G. M. See Hunter, G. T.
Clark, H. T., Catlin, J. P., and Gregg, W. E. TITANIUM TECHNOLOGY IN MID-1954 16
Clark, O. W. See Poindexter, L. C.
Clark, P. S. See Hartmann, H. F.
Clark, R. O. See Snyder, R. E.
Clark, W. W. METER COVERS GAINING IN POPULARITY AMONG DOMESTIC GAS CONSUMERS 35;—KUYKENDALL CITES "COMMISSION DISCRETION" AS RAY OF HOPE FOR GAS PRODUCERS 37;—WILL GAS COMPANIES INTENSIFY EXPLORATION ACTIVITIES? 67;—COMPETITIVE DOMESTIC AIR CONDITIONER USES GAS-DRIVEN COMPRESSOR 102;—DEALERS "HEATING INSTITUTE" BRINGS RELUCTANT CONTRACTORS INTO THE FOLD 174;—MEET THE OIL HEATING COMPETITION ON THE BATTLEGROUND OF EFFICIENCY 175
Clarke, A. B. CONVERSION OF A CARBONACEOUS MATERIAL-WATER SLURRY 177
Clarke, L. and Winston, R. E. CALCULATION OF FINSIDE COEFFICIENTS IN LONGITUDINAL FINNED-TUBE EXCHANGERS 114

Clarke, R. M. and Wright, G. F. THE EXPLOSIBILITY OF WET AMMONIA-AIR MIXTURES 151
Clason, V. E. ACID KINETICS IN LIMESTONE FORMATIONS 107
Clerc, R. J., Hood, A. and O'Neal, M. J., Jr. MASS SPECTROMETRIC ANALYSIS OF HIGH MOLECULAR WEIGHT SATURATED HYDROCARBONS 183
Clough, K. H. ANALYSIS OF GASEOUS MIXTURES WITH A NEW UNIT 221
Cocanower, R. D. BETTER RESULTS FROM SHAPED CHARGES 164
Cole, H. G. TESTS ON THE RELATIVE EFFICIENCY OF CHROMATE PIGMENTS IN ANTI-CORROSIVE PRIMERS 187
Cole, V. GAS AIR-CONDITIONING SYMPOSIUM 189
Coleman, H. J. See Thompson, C. J.
Coleman, J. P. OUR CAPACITY TO PRODUCE OIL IN THIS COUNTRY 166
Coleman, S. WHY A GAS HEAT PUMP IS ESSENTIAL 17
Collins, J. H. NATURAL GAS STILL NEEDS EXPLAINING 158
Collins, S. V. APPARATUS FOR LAYING AND RETRIEVING PIPE LINES 110
Comings, E. W. See Alexander, L. G.
Compton, N. W. LOW-TEMPERATURE "DRY" GAS PLANT FOR DENVER-JULESBURG 216
Conselman, F. B. THE JAMESON-STRAWN SAND TREND 166
Coope, J. R. and Maingot, G. J. SENSITIVE DETERMINATION OF LOW BOILING ORGANIC SULFUR COMPOUNDS 221
Cooper, W. B. LIQUID HEATING AND COOLING FOR YEAR-ROUND AIR CONDITIONING 158
Corcoran, J. T. CONTINUOUS DETERMINATION OF OXYGEN IN GASES 150
Corey, R. C. See Elliott, M. A.
Corfield, G. PLASTIC PIPE SUBCOMMITTEE PROGRESSING TOWARD ESTABLISHMENT OF STANDARDS 116;—REPORT ON PLASTIC PIPE STANDARDS 172
Cornell, D. CALCULATION OF STABILIZED GAS WELL PERFORMANCE CURVES FROM BACK PRESSURE TEST DATA 165; See Parish, C. E.; See Sukkar, Y. K.
Corrigan, T. E. CHEMICAL ENGINEERING FUNDAMENTALS. PART II: CATALYSTS AND ADSORPTION 53;—PART III: KINETICS OF HOMOGENEOUS REACTIONS 14;—PART IV: INTERPRETATION OF KINETIC DATA 186
Cottrell, J. L. GAS MEASUREMENT AND INTEGRATION CLINIC 88
Courter, M. L. See Nelson, C. R.
Craig, F. F., Jr., Geffen, T. M., Morse, R. A. OIL RECOVERY PERFORMANCE OF PATTERN GAS OR WATER INJECTION OPERATIONS FROM MODEL TESTS 70
Cramer, A. H. HIGHLIGHTS OF THE NEW PIPING CODE 48
Cramer, F. R. WATER INJECTION CURBS ENGINE DETONATION 196;—PANIC BUTTON CONDITIONS SCAVENGING AIR: FIGHTING DETONATION WITH CONDITIONED, SCAVENGED AIR 210
Crawford, P. See Bass, D. M.
Crawford, P. B. HORIZONTAL FRACTURES IN THIN RESERVOIRS. PART VII: CONDUCTIVITY OF FIVE-SPOT PATTERN 91;—Bradford, R. I., England, A. C. and Ince, H. HOW TO DETERMINE STATIC BOTTOM-HOLE PRESSURE FROM SURFACE MEASUREMENTS 200
Cretzler, D. J. FLOW MODULATING VALVE 3
Crockett, L. O. THE NATURAL-GASOLINE PRODUCER'S STAKE IN CHEMICAL MANUFACTURE 133
Croess, G. A. and Schwarz, N. DIMENSIONALLY SCALED EXPERIMENTS AND THE THEORIES ON THE WATER-DRIVE PROCESS 144
Cronin, W. and Lang, J. F. PEAT-FIRED POWER STATIONS 20
Crutchley, W. F. DISTRIBUTION OF GAS FROM STORAGE TO MARKET 146
Cumming, A. P. APPLICATION OF INFRA-RED SPECTROMETRY TO THE ANALYSIS OF COMBUSTION PRODUCTS CONTAINING CARBON DIOXIDE, CARBON MONOXIDE AND SMALL PROPORTIONS OF PROPANE 28;—NOMOGRAM FOR DETERMINATION OF EXCESS AIR IN COMBUSTION 190
Cummings, W. W. METHOD OF AIR CONDITIONING 2
Cunningham, L. J. and Williams, S. V. NORTHERN NATURAL'S WELDING TESTS SHOW 30° PIPE BEVEL BEST FOR PIPELINES 172
Cunningham, M. TEXAS MARKS THE TRAIL TOWARD A BOOM IN ALL-YEAR AIR CONDITIONING WITH GAS 2
Curran, R. M. and Rankin, A. W. PREVENTING WELD CRACKS IN 1100° F. STAINLESS PIPING 156
Curtis, A. C. APPARATUS FOR COATING THE INTERIOR OF WELL PIPES 208

D

Dack, W. L. TRANS-CANADA GAS LINE CONSTRUCTION DELAYED UNTIL 1956 157
Dahme, A. and Junker, H. J. DIE REAKTIVITAET VON KOKS GEGEN CO_2 IM TEMPERATURBEREICH 1000-1200° C. (THE REACTIVITY OF COKES TOWARD CO_2 IN THE TEMPERATURE RANGE 1000-1200° C. 214
Dalin, D. METHOD AND APPARATUS FOR THE DESTRUCTIVE DISTILLATION OF OIL SHALE 91
Darwent, B. D. See Sehon, A. H.
Davenport, C. H. BOOM STILL ON FOR U. S. AMMONIA 113
Davies, R. G. and Hartmann, H. F. THE USE OF PYRITES CINDERS IN TOWN'S GAS PURIFICATION 161
Davis, A. S., Jr. ELECTRIFIED CENTRIFUGAL GAS CLEANING DEVICE 185
Davis, E. W. METHOD FOR HEATING SOLIDS 42
Davis, P. C., Bertuzzi, A. F., Gore, T. L., and Kurata, F. THE PHASE AND VOLUMETRIC BEHAVIOR OF NATURAL GASES AT LOW TEMPERATURES AND HIGH PRESSURES 72
Davis, R. L. HOW RHEEM LINES WATER HEATERS WITH GLASS 103
Day, J. F. UNDERGROUND PIPELINE CORROSION AND CATHODIC PROTECTION 100
Day, S. G. DRILLING OPERATIONS IN THE APPALACHIAN BASIN 107
Dean, P. W. GAS MANUFACTURE 22
Dean, R. R. SIMPLICITY, FLEXIBILITY, ECONOMICAL OPERATION 46
Decker, W. H. and Stewart, D. FIRST SINCLAIR CATALYTIC REFORMER 202
de Coriolis, E. G. HIGH SPEED HEATING OF STEEL FOR PLASTIC DEFORMATION 155
DeFord, D. D. See Hussey, A. S.
Deissler, R. G. ANALYSIS OF TURBULENT HEAT TRANSFER, MASS TRANSFER, AND FRICTION IN SMOOTH TUBES AT HIGH PRANDTL AND SCHMIDT NUMBERS 34
de la Pomélie, M. M. METHOD AND MEANS FOR DEFINING AND ADJUSTING THE LEVEL OF A LOAD OF SOLID MATERIAL INSIDE A NON-TRANSPARENT CHAMBER 54
Delsol, R. EVOLUTION OF GAS PRODUCTION TECHNIQUES IN FRANCE 214
Denison, I. A. See Schwerdtfeger, W. J.
Dennis, R. See Johnson, G. A.

Dent, F. J. THE USE OF OXYGEN IN GASIFICATION 194
Deutsch, M. L. and Hicks, J. S. SIMULTATION OF A REFINERY BY A DIGITAL COMPUTER 207
De Voe, W. F. See Benz, G. R.
Dewees, E. J. See Smith, R. V.
De Witte, L. CURRENT REQUIREMENTS FOR CATHODIC PROTECTION OF WELL CASING 181;—A STUDY OF ELECTRIC LOG INTERPRETATION METHODS IN SHALY FORMATION 182;—and Radd, F. J. CORROSION OF OIL WELL CASING BY EARTH CURRENTS 130
DeZubay, E. A. A STUDY OF FLAME STABILITY BASED ON REACTION RATE THEORY 103
Diamond, G. B. THE WEST MIDLANDS APPROACH TO THE GASIFICATION OF RESIDUAL OIL 43
Dick, I. B. PLANT ATTACKS SILICA PROBLEM WITH MONOBED DEMINERALIZATION 156
Dickinson, F. and Johnson, F. J. SOME APPLICATIONS OF GAS IN INDUSTRY..LADLE HEATING IN THE STEEL INDUSTRY-PIPE BENDING 123;—TECHNICAL PROBLEMS IN THE UTILIZATION OF TOWN GAS IN INDUSTRY 140
Dickson, N. L., Hill, L. R., and Williams, T. S. MANUFACTURE OF A HYDROGEN-RICH GAS 44
Diebold, P. SEPARATOR FOR DUST CARRYING GASES 8
Diehl, A. E. See Laube, H. L.
Dijkstra, H. See Schuyer, J.
Dillon, C. P. See Polderman, L. D.
Dinneen. G. U., Smith, J. R., Van Meter, R. A., Allbright, C. S., and Anthoney, W. R. APPLICATION OF SEPARATION TECHNIQUES TO A HIGH-BOILING SHALE-OIL DISTILLATE 93
Directie van de Staatsmijnen See Goedkoop, M. L.; See Van Krevelen, D. W.; See van Loon, W.
Dirksen, H. A., Linden, H. R. and Pettyjohn, E. S. AUTOHYDROGENATION OF OIL GASES 161
Dixon, B. E. and Kiff, P. R. USE OF PERFORATED AND POROUS PLATES IN GAS ABSORPTION 225
Dixon, G. F. CONTROLLING GENERAL EQUIPMENT 114
Dodge, B. F. See Van Ness, H. C.
Doherty, W. See Melpolder, F. W.
Dole, M. See Worthington, A. E. 205
Dolezal, R. SAVING MOLYBDENUM AND OTHER ALLOYS IN HIGH PRESSURE STEAM EQUIPMENT 227
Donath, E. E. FUELS AND CHEMICALS FROM COAL HYDROGENATION 22
Donsky, A., Naubereit, H., and Paulovich, M. DEW POINT INDICATOR 226
Dorfman, L. M. and Shipko, F. J. THE BETA-PARTICLE RADIOLYSIS OF ACETYLENE 223
Dotterweich, F. H. COURSES OF STUDY AT TEXAS A & I EXPAND WITH THE GAS INDUSTRY 37;—and Mooney, C. V. DESIGNING AND OPERATING GAS JET COMPRESSORS 164
Dougherty, P. F. HOW SUN CREATED UNDERGROUND STORAGE 88
Dougherty, T. PACIFIC NORTHWEST PIPE LINE KEY TO NEW FRONTIER 37
Dougherty, W. J. See Van Dyke, B. H.
Douglas, L. W. See Gustavson, R. G.
Douglas, P. H. FEDERAL REGULATION OF INDEPENDENT NATURAL GAS PRODUCERS IS ESSENTIAL 209
Douglas, T. B., Furukawa, G. T., McCoskey, R. E., and Ball. A. F. CALORIMETRIC PROPERTIES OF NORMAL HEPTANE FROM 0° to 520° K. 12
Dow Chemical Co. See Guebert, K. W.
Downe, E. R. PRESSURE REGULATOR MEANS FOR GAS PILOT BURNER 105
Downey, W. P. RIGGING AND REFINERY CONSTRUCTION ECONOMICS 74
Downing, J. A. See Link, T. A.
Drane, C. W. WATER TREATMENT 208
Drushel, H. V. and Miller, J. F. SPECTRO-PHOTOMETRIC DETERMINATION OF ALIPHATIC SULFIDES IN CRUDE PETROLEUM OILS AND THEIR CHROMATOGRAPHIC FRACTIONS 150
Dryden, I. G., Griffith, M. and Kirby, R. A. COKE FORMATION AND COAL BLENDING 177
Duerr, W. See Huber, L.
Duewel, G. EXPERIENCE GATHERED BY THE APPLICATION OF VARIOUS TEST METHODS FOR THE DETERMINATION OF THE COKING PROPERTIES OF COAL 214
Duff, B. S. ECONOMICS OF AMMONIA MANUFACTURE FROM SEVERAL RAW MATERIALS 96
Duff, D. M. GAS GIRDS TO FEND OFF FEDERAL CONTROL 157
Duggan, M. See Swerdloff, W.
Dugger, G. L. and Simon, D. M. PREDICTION OF FLAME VELOCITIES OF HYDROCARBON FLAMES 80;—Weast, R. C., and Sheldon, H. FLAME VELOCITY AND PREFLAME REACTION IN HEATED PROPANE-AIR MIXTURES 81;—See Wagner, P.
Dunbar, R. J. and Rufleth, W. SYSTEM-WIDE TELEMETERING AIDS ALGONQUIN GAS OPERATIONS 9
Dunn, T. H. See Huebotter, E. E.
Dunningham, A. C. PRESSURE HOT WATER 79
du Pont de Nemours, E. I. and Co. See Hines, R. A.; Milligan, T. J.; Moses, D. V.; See Peery, L. C.
Durfee, J. R. WISCONSIN AND THE PHILLIPS CASE 58
Dworkin, D. See Jorczak, J. S.
Dwyer, O. E., Horn, F. L. and Weisman, J. FORCED CONVECTION BOILING AND PRESSURE DROP DATA. PART III 98 See Sheehan, T. V.
Dyes, A. B. PRODUCTION OF WATER-DRIVEN RESERVOIRS BELOW THEIR BUBBLE POINT 67
Dzwarc, M. See Leigh, C. H.

E

Eacker, E. H. OUTLOOK PARALLELS GAINS 57
Eakin, B. E., Ellington, R. T. and Gami, D. C. PHYSICAL-CHEMICAL PROPERTIES OF ETHANE-NITROGEN MIXTURES 168; See Bloomer, O. T.
Easly, J. C., and Kellnew, H. L. METHOD STARTING UP HYDROCARBON SYNTHESIS UNITS 10
Ebdon, J. F. SIX YEARS OF OPERATION PROVE THE VALUE OF AUTOMATIC BOOSTER STATION 24;—APPLICATION OF CLOSED TV TO PIPELINE CONTROL HIT OF AGA OPERATING SESSIONS 24;—DIGITAL COMPUTERS THEIR APPLICATION TO THE GAS INDUSTRY'S ENGINEERING PROBLEMS 64; — WAREHOUSE DESIGN 65; WHAT'S THE PREFERRED BASIS FOR METER CHANGE-OUTS 66;—BUILDING AN OFF-PEAK AND FRINGE LOAD 67;—PIPE YARD DESIGN 89;—HERSCHER: FIRST USE OF WATER SAND FOR NATURAL GAS STORAGE 200;—NATURAL GAS FOR THE PACIFIC NORTHWEST 209
Edelhausen, L. See Blom, L.
Edge, R. F. See Hebden, D.
Edmister, W. C. IMPROVED INTEGRAL TECHNIQUE FOR PETROLEUM DISTILLATION CALCULATIONS 223;—and Ruby, C. L. GENERALIZED ACTIVITY COEFFICIENTS OF HYDROCARBON MIXTURE COMPONENTS 94
Edwards, G. See Rumford, F.
Edwards, M. R. GAS BURNER AND SUPPORT 2
Edwards, T. MECHANISM FOR FEEDING GRANULAR OR POWERED MATERIAL FROM A RELATIVELY LOW PRESSURE TO HIGHER PRESSURE 206

Egan, E. J. and Luthy, R. V. SEPARATION OF XYLENES 73
Egan, E. E. and McKay, A. S. NEW METHOD SIMPLIFIES WATER INJECTIVITY PROFILE LOGGING 110
Egan, P. C. TINGELY: LIQUOR EFFLUENT TREATMENT PLANT 21
Eggleston, G. E. and Brimley, D. E. HEAT-EXCHANGER SELECTION BY COMPUTATION MACHINE METHODS 98
Ehrat, A. M. FREE-PISTON GAS-TURBINE PRIME MOVERS 104
Ehret, L. See Hahnemann, H. W.
Eickmeyer, A. G. and Marshall, W. H., Jr. AMMONIA SYNTHESIS—GAS GENERATION BY PRESSURE REFORMING OF NATURAL GAS 224
Eischens, R. P. See Webb, A. N.
Ellington, R. T. See Bloomer, O. T.; See Eakin, B. E.
Elliott, M. A., Corey, R. C., and Perry, H. APPARATUS FOR CONDUCTING HETEROGENEOUS CHEMICAL REACTIONS 83
Elliott, P. M. AN INTRODUCTION TO "KRALASTIC" 116
Ellis, S. R. EQUILIBRIUM CALCULATIONS 73
Ellis, W. H. See LeTourneau, R. L.
Elonka, S. YOU MUST KNOW HOW TO HEAT RESIDUAL FUEL OIL 220
Elving, P. J. APPLICABILITY OF MEGACYCLE FREQUENCY OSCILLATOR CIRCUITS TO REACTION RATE MEASUREMENT 72
Emmons, H. W., Pearson, C. E. and Grant, H. P. COMPRESSOR SURGE AND STALL PROPAGATION 162
Engel, W. F. and Hoog, H. TREATMENT OF HYDROCARBON OILS 68
England, A. C. See Crawford, P. B.
Enright, R. J. GAS BATTLE SHAPES UP 101;—L.P.G. FLOODING TESTED IN TEXAS 108;—TEXANS BEGIN OIL SEARCH IN HONDURAS 163
Erbe, C. B. IN ARKANSAS' HARD ROCKS EXHAUST GAS BOOSTS DRILLING RATE 86
Erickson, R. A. See Caudle, B. H.
Ernst, R. D. See Lehane, T. J.
Escolas, E. J. and Woodward, H. B. COLUMBIA GAS SOLVES A DISTRIBUTION PROBLEM WITH A NETWORK ANALYZER 88
Esso Research and Engineering Co.; See Etherington, L. D.; Etienne, A.; Hill, R. M.; Krebs, R. W.; Nicholson, E. W.; Vickers, H. H.; Wylie, R.
Everett, G. W. and Reilley, C. N. COULOMETRIC TITRATIONS WITH PHOTOMETRIC END POINT 30
Everetts, J., Jr. WEATHER DESIGN FACTORS AIR CONDITIONING 189
Evers, J. P. See Tirrell, R. W.
Eynon, S. B. INSURANCE AGAINST GAS BLASTS 164
Eyth, W. S. and Faber, R. L. TAKE A LOOK AT ELECTRIC HEATERS 156
Ezekiel, F. D. A NEW TYPE OF FLOWMETER FOR COMPRESSIBLE FLUIDS 75

F

Faber, R. L. See Eyth, W. S.
Faigen, B. See Laube, H. L.
Fairchild, W. R. See Akers, W. W.
Farber, E. A. See Akerman, J. R.
Farmer, J. B. and Lossing, F. P. FREE RADICALS BY MASS SPECTROMETRY. VII. THE IONIZATION POTENTIALS OF ETHYL, ISOPROPYL, AND PROPARGYL RADICALS AND THE APPEARANCE POTENTIALS OF THE RADICAL IONS IN SOME DERIVATIVES 151
Farnham, P. L. GAS PRODUCER FOR USE WITH A TURBINE POWER PLANT 123
Farnsworth, H. S. FACTORS TO CONSIDER IN DESIGNING A COMPRESSOR STATION 85
Farnsworth, J. F., Manes, McGurl, G. V. and Bretz, G. M. ETHYLENE AND ACETYLENE PRODUCTION 205
Farrar, G. L. STOP THAT COSTLY CORROSION IN REFINING EQUIPMENT 208
Farrow, H. L. METHOD OF PREPARATION OF SUPPORTED NICKEL, COBALT, OR COPPER CATALYSTS 68
Feaster, D. J. and Cammen, M. M. ROTARY VERSUS PISTON AIR COMPRESSORS 127
Fetterly, L. C. UREA COMPLEXES..HOW THEY'RE APPLIED 148
Field, J. H. See Benson, H. E.
Finch, H. De V. See Ballard, S. A.
First, M. W. See Johnson, G. A.
Fisher, E. H. SUPER-INCH LINE FAILURE: LIMIT DOWNTIME TO 12 HOURS 217
Fiske, C. E. and Miller, R. ECONOMICS OF ADC ELECTROLYTIC MERCAPTAN PROCESS 27
Fitch, E. C. See Boggs, J. H.
Fitzgerald, D. AN APPARATUS FOR MEASURING THE VISCO-ELASTIC PROPERTIES OF COAL IN THE COURSE OF CARBONIZATION 216
Fletcher, H. B. MAKING VICTORIA INDEPENDENT VIA 102-MILE LONG MANUFACTURED GAS LINE 178
Flosdorf, E. W. THE HIGH-VACUUM STANDARD—THE McLEOD GAGE 35
Flournoy, R. W. PRELIMINARY EVALUATION OF PROTECTIVE COATING SYSTEMS 208
Fluor Corporation Ltd. See Blohm, C. L.
Foley, K. W. See Hebden, D.
Folkins, H. O., Miller, E. and Hennig, H. PROCESS FOR THE MANUFACTURE OF CARBON DISULFIDE 169
Fong, J. T. SHORT CUT TO AIR RECEIVER DESIGN 151
Fontana, M. G. CORROSION—TENTH OF A SERIES—DESCRIBES PROCEDURES FOR STRESS-CORROSION TESTS 172
Food Machinery and Chemical Corp. See Folkins, H. O.
Foster, A. L. HYDROGENATION IMPROVES SHALE OIL REFINABILITY 27; — TAMING "WILD" GASOLINE 46
Foster, J. F. See Levy, A.
Foulds, J. G. See Kreider, R. E.
Francis, A. W. TERNARY SYSTEMS OF LIQUID CARBON DIOXIDE 51; See Gravis, C. K.
Francis, C. B. CONVERSION OF LIQUID HYDROCARBONS TO FIXED GASES 106
Frank, H. G. DIE WAHRE NATURE DES STEINKOHLENTEERPECHS. (THE TRUE NATURE OF COAL TAR PITCH) 73
Fredersdorff, von, C. G. REACTIONS OF CARBON WITH CARBON DIOXIDE AND WITH STEAM 176; See Pettyjohn, E. S.
Freeland, M. Q. See Fritz, J. S.
Freeman, R. S. and Weyermuller, G. TWO YEARS SERVICE IN CAUSTIC AND ACID AREA 187
French State See Stauff, E.
Friedlander, S. K. See Johnson, G. A.
Frink, J. HASCHE GAS REFORMERS IN FLORIDA 179
Fritz, J. S. and Freeland, M. Q. DIRECT TITRIMETRIC DETERMINATION OF SULFATE 11
Fritz, N. L. ANALOG COMPUTER FOR NON-LINEAR COORDINATE TRANSFORMATION 75
Frohlich, G. J. See Othmer, D. F.
Fruechtenicht, H. L. UNDERGROUND GAS STORAGE 202
Fugate, W. O. and Tribit, S. W. PRODUCTION OF PHTHALIC ANHYDRIDE AND ABRASION-RESISTANT FLUID CATALYST 52
Fuller, L. S. and Lockett, D. E. HOW AIR AND

GAS DRILLING AIDED WILDCAT OPERATIONS 65
Funk, E. J., Jr. INERT GAS GENERATORS FOR CHEMICAL PROCESSING 7
Funk, W. H. IN PRESSURE VESSEL DESIGN WHEN TO USE THE ALLOY STEELS 225
Furnas, C. C. ENERGY SOURCES OF THE FUTURE 57
Furukawa, G. T. See Douglas, T. B.

G

Gabourel, J. D., Baker, M. J. and Koch, C. W. SIMULTANEOUS DETERMINATION OF TOTAL CARBON AND CARBON-14 ACTIVITY COMBUSTION METHOD 132
Gagnaire, L. COMPLETE GASIFICATION OF CAKING COALS 213
Galluzzo, J. F. See Canjar, L. N.
Gami, D. C. See Bloomer, O. T.; See Eakin, B. E.
Garbo, P. W. PROCESS FOR PRODUCING ACETYLENE 13
Gardner, F. J. TEXAS OIL FLOWS FROM ROCKS OF EVERY GEOLOGICAL AGE 92
Garner, F. H. and Skelland, A. H. MECHANISM OF SOLUTE TRANSFER FROM DROPLETS LIQUID-LIQUID EXTRACTION 33
Garner, P. INSTALLATION PLANNING 119
Garrett, W. R. GASHOLDER DEVELOPMENT AND DESIGN 128
Garrett Corp. See Green, F. H.
Garthwaite, D. L. See Stewart, F. M.
Gaskill, M. S. CARBONISATION: PRESENT AND FUTURE 6
Gas Machinery Co. See Stookey, K. W.
Gatlin, C. PERFORATING OF ALL TYPES 108
Gavin, H. W. CONTROL FIRE METHOD FOR GAS PIPE LINE REPAIR 217
Gayhart, E. L. See Olsen, H. L.
Gaz de France See De La Pomélie, M. M.
Gee, H. W. HOW COMPLETELY AUTOMATIC PLANT WORKS 7
Gee, R. W., Linton, W. H., Maier, R. E., and Raines, J. W. USE OF COMPUTERS IN KINETIC CALCULATIONS 75
Geffen, T. M. See Craig, F. F., Jr.
Gehre, H. GAS FLOW MEASURING EQUIPMENT 99
Geisselbrecht, G. ATHYLEN, EIN KOHLENWERTSTOFF (ETHYLENE, A COAL CHEMICAL) 133
General Controls Co. See Grayson, J. H.; Ray, W. A.
General Electric Co. See Herbst, R. S.
General Power Plant Corp. See Holby, W. H.
Gent, L. L., Miller, C. P., and Pomatti, R. C. SPECTROGRAPHIC ANALYSIS OR PETROLEUM PRODUCTS AND RELATED MATERIALS 71
Gentry, R. M. and Gunther, V. H. COBALT BROMIDE TEST: WATER SOLUBILITY IN LIQUID PROPANE 92
George, H. H. See Markl, A. R.
Gerhard, E. R. and Johnstone, H. F. MICRODETERMINATION OF SULFURIC ACID AEROSOL 132
Gesellschaft fuer Linde's Eismachinen A.—G See Karwat, E.
Ghai, M. L. and Sundaram, R. SELECTION OF OUTSIDE DESIGN TEMPERATURE FOR HEAT LOAD ESTIMATION 18
Gibson Refrigerator Co. See Rutenber, E. A.
Gigiel, J. See Sansam, W.
Gilbert, G. R. FLUIDIZED DISTILLATION OF OIL SHALE BY DIRECT HEATING WITH A HEATED LIQUID SPRAY 91
Gilbert, T. M. STABILIZATION AT THE CITY GATE 85
Gillet, A. DIE ENTWICKLUNG DER HUMINE AUS VERHOLTZER MATERIE VON DER ZELLULOSE ZUM ANTHRAZIT (THE DEVELOPMENT OF HUMINS FROM LIGNIFIED MATERIAL FROM CELLULOSE TO ANTHRACITE) 124
Gillette, J. M., Boyd, B. R., and Shurkus, A. A. SPECTROCHEMICAL DETERMINATION OF METALLIC ELEMENTS IN NONMETALLIC SAMPLES 71
Gilmore, E. R. TROUBLESHOOTING DISPLACEMENT METERS 218
Gilmore, F. E. PROCESS AND APPARATUS FOR CONTROL OF GAS TREATMENT 25
Gionta, A. See Sallee, W. L.
Gladfelter, R. E., Tracy, G. W. and Wilsey, L. E. SELECTING WELLS WHICH WILL RESPOND TO PRODUCTION-STIMULATION TREATMENTS 164
Glamser, J. H. REMOTE CONTROL OF UNDERGROUND GAS 181
Glass, D. C. WHEN DOES CATHODIC PROTECTION PAY OUT 187
Glass, H. D. INVESTIGATION OF RANK IN COAL BY DIFFERENTIAL THERMAL ANALYSIS 23
Glazier, E. M. PRODUCTION OF GAS COMPRISING HYDROGEN AND CARBON MONOXIDE 22
Glenn, R. A. COAL HYDROGENATION PROCESS STUDIES: IV — EFFECTS OF PRE-HEAT ON RESTRICTED HYDROGENOLYSIS 23
Godrick, J. See Leah, A. S.
Goedkoop, M. L. PREPARATION OF CATION EXCHANGE MATERIAL FROM COAL 21
Goff, J. C. APPARATUS FOR MEASURING THE DENSITY OF GASES 207
Goland, M. and Koenigsberg, E. OPERATIONS RESEARCH: SCIENTIFIC APPROACH TO MANAGEMENT 117
Gonzalez, R. A. See Laube, H. L.
Gore, T. L. See Davis, P. C.
Gorin, E. MANUFACTURE OF WATER GAS 126; —and Zielke, C. W. DESULFURIZATION OF LOW TEMPERATURE CARBONICATION CHAR 213; See Zielke, C. W.
Gough, R. H. AN ENCLOSED-FLAME RADIANT BURNER FOR GASEOUS FUELS 41
Gould, E. D. See Barrett, J. P.
Gourley, R. L. WATER HEATERS FOR RENT 190
Grahame, J. H. See Teichmann, C. F.
Grahl, E. R. STEP-WISE HEAT TRANSFER CALCULATIONS 74
Granatelli, L. OXYHYDROGEN BURNER FOR DETERMINATION OF SULFUR IN DRIP OILS 94
Granet, I. HEAT EXCHANGER EXPANSION CALCULATIONS 226
Grant, A. F. and Lewis, C. H. LARGE SCALE CARRIER GAS CARBONISATION IN THE NORTH THAMES AREA 141
Grant, H. P. See Emmons, H. W.
Grant, J. D. GAS MANUFACTURE—A GLOBAL SURVEY 57
Grant, W. C. HOW TO FREE PRODUCERS FROM REGULATION 17
Gravis, C. K. GAS DEHYDRATION TODAY: GAS DEHYDRATION, AN IMPORTANT FUNCTION OF LOW-TEMPERATURE SEPARATION: Mize, W. W. OPERATOR'S COMMENTS: Francis, A. W. MANUFACTURER'S COMMENTS 196
Gray, V. R. and Whelan, P. F. QUICK MOISTURE METHOD FOR COAL 92
Grayson, J. H. THERMOSTATIC GAS COCK 3
Greaves, M. S. HOW TO CALCULATE GAS LINE FLOW EFFICIENCIES 200
Gregg, W. E. See Clark, H. T.
Green, F. H. REFRIGERATION AND VENTILATION DEVICE 59
Griffith, D. O. CATHODIC PROTECTION APPLIED TO A LARGE-DIAMETER OIL PIPE LINE SYSTEM 115
Griffith, M. See Dryden, I. G.
Griffith, R. H. SULPHUR REMOVAL FROM FUEL GASES BY DRY METHODS 25

Griffiths, J. C. RESEARCH IN PILOT BURNER DESIGN, CONSTRUCTION AND PERFORMANCE: SECOND BULLETIN—THE EFFECT OF PILOT BURNER ASSEMBLY MATERIALS AND GAS COMPOSITION ON PILOT BURNER OUTRAGE AT ELEVATED TEMPERATURES 120; See Hutta, J. J.
Grimes, M. D., Puckett, J. E., Newby, B. J. and Heinrich, B. J. AMPEROMETRIC METHOD FOR MERCAPTAN SULFUR IN HYDROCARBONS 70
Grinrod, J. GAS FROM BROWN COAL IN VICTORIA, AUSTRALIA 84
Gring, J. L. See Hettinger, W. P., Jr.
Grocott, F. OXIDE PURIFICATION IN THE MIDLANDS 195
Groenewege, M. P., Schuyer, J. and Van Krevelen, D. W. CHEMICAL STRUCTURE AND PROPERTIES OF COAL: X-DIELECTRIC CONSTANTS OF LOW RANK AND BITUMINOUS COALS 177
Grosber, J. A. and Mapstone, G. E. SHORT CUT TO V-L EQUILIBRIA SOLUTIONS 145
Grote, P. ROTARY IMPELLER GAS METERS 186
Grother, M. P. See Lambert, J. L.
Grumer, J., Harris, M. E. and Rowe, V. R. STUDY OF THE YELLOW-TIPPING CHARACTERISTICS OF FUEL GASES 4;—Harris, M. E. and Schultz, J. FLAME-STABILITY LIMITS OF ETHYLENE, PROPANE, METHANE, HYDROGEN, AND NITROGEN MIXTURES 211
Guebert, K. W. CARBON BISULFIDE PRODUCTION 205
Guillet, R. See Queret, Y.
Guinot, H. M. RECOVERY OF CONDENSABLE COMPONENTS FROM A GAS AND VAPOR MIXTURE 144
Gulf Research and Development Co. See Easly, J. C.; Glazier, E. M.; Montgomery, C. W.
Gumz, W. THE FUEL AND POWER RESOURCES OF GERMANY AND THEIR UTILIZATION 194
Gunn, E. L. NONMETAL ANALYSIS OF MICROQUANTITIES OF SOLIDS BY EMISSION SPECTRUM 20
Gunther, V. H. See Gentry, R. M.
Gustavson, R. G. and Douglas, L. W. THE NATION LOOKS AT ITS RESOURCES: REPORT OF THE MIDCENTURY CONFERENCE ON RESOURCES FOR THE FUTURE 36
Guthrie, V. E. FOR PETROCHEMICALS—THINGS ARE PICKING UP 224

H

Hahnemann, H. W. and Ehret, L. AN ELECTROLYTIC TANK FOR MEASUREMENTS OF VELOCITY AND POTENTIAL FIELDS 170
Hale, D. SEVEN YEARS LATER 129
Hall, A. M. GRAPHITIZATION IN STEEL 56
Hall, C. C. and Taylor, A. H. FLUIDISED PILOT PLANT FOR THE FISCHER-TROPSCH SYNTHESIS 130
Hall, N. A. and Ibele, W. E. COMPRESSIBILITY DEVIATIONS FOR POLAR GASES 72
Ham, D. L. DESIGN AND APPLICATION OF CORROSION CURRENT MEASURING INSTRUMENTS 227
Hamann, S. D., Lambert, J. A. and Thomas, R. B. THE SECOND VIRIAL COEFFICIENTS OF SOME GAS MIXTURES 219
Hamberg, I. H. AUTOMATISKA VARMVATTENAPPARATER AV GENOMSTROEMNINGSTYP (AUTOMATIC HOT WATER APPARATUS OF THE THROUGH-FLOW TYPE) 59
Hample, T. E. and Stone, R. L. LITERATURE REVIEW AND DESIGN STUDIES OF GAS APPLIANCE VENTING SYSTEMS 118
Hancher, C. W., and Kammermeyer, K. SEMI-AUTOMATIC GAS SEPARATION EQUIPMENT 203
Handley, L. R. See Chilton, E. G.
Hangs, F. E. WHAT ABOUT INTERNAL PIPE COATING? 16;—DETERMINING OPERATING PRESSURES 146
Hansen, W. C. and Livovich, A. F. FACTORS INFLUENCING THE PHYSICAL PROPERTIES OF REFRACTORY CONCRETES 16
Hardgrove, R. M. See Bailey, E. G.
Hardwick, J. M. TOWN GAS FROM COAL 44
Harnish, J. R. VARIOUS METHODS FOR USING EVAPORATIVE CONDENSERS 175
Harris, M. E. See Grumer, J.
Harris, M. R. and Sing, K. S. THE SURFACE PROPERTIES OF PRECIPITATED ALUMINA 151
Harrison, A. D. THE ECONOMICS OF PEAK SHAVING AND STORAGE GAS 101;—IS OIL GAS COMPETITIVE WITH NATURAL? 189
Harrow, G. A. See Spice, J. E.
Harper, J. I. and Luther, M. W. PROCESS FOR HYDROGENATING HYDROCARBON OILS 148
Harper-Wyman Co. See Lamar, C. C.
Hart, J. S. THE ACCURATE MEASUREMENT OF HYDROGEN SULPHIDE IN TOWN GAS 203
Hartmann, H. F. and Clark, P. S. AN IMPROVED GAS ANALYSER 132; See Davies, R. G.
Hartung, C. A. FLAME FAILURE CONTROL 39
Hartwick, E. F., Miners, K. A., and Phillips, N. W. PROCEDURE FOR TREATING SOLID MATERIAL WITH GAS AT HIGH TEMPERATURE 61
Hartwig, C. H. SIXTY-CYCLE INDUCTION HEATING OF LARGE STEEL SECTIONS FOR HOT FORMING 5, 104
Hartzell Industries, Inc. See Johnston, D. W.
Haskin, J. F. See Yarbrough, V. A.
Hastings, G. T. MODERN HOT WATER SUPPLY 59;—IMPROVEMENT CONTINUES IN HOT-WATER HEATING SYSTEMS 119
Hastings, S. H. and Johnson, B. H. SPECTROPHOTOMETRIC DETERMINATION OF ALIPHATIC SULFIDES 150
Hathaway, H. CHICKEN SELLER GOOD PICKING 61
Hatton, W. D. EFFECT OF CHANGES IN GAS COMPOSITION ON COMBUSTION CHARACTERISTICS 41
Hauck, C. J. FORMATION FRACTURE OPERATIONS IN OHIO 145
Haug, J. S. METHOD FOR PRODUCING OIL GAS 142
Haught, O. L. CONDITIONS FOR THE PRESERVATION OF EARLY PALEOZOIC OIL 147
Hawkins, M. F., Jr. and Kimmel, M. L. A ROTATIONAL HIGH PRESSURE VISCOSIMETER 35
Hawksley, P. G. PARIS CONFERENCE ON GAS CLEANING 197
Hawley, E. R. and Solomon, E. SAMPLER FOR GASES AT HIGH PRESSURE 203
Hayes, C. T. See Uhlen, A. E. 211
Hazlett, R. H. and Almquist, W. E. IF DUST IS POLISHING AWAY DOLLARS 87
Heard, T. C. CENTRIFUGAL COMPRESSORS FOR GAS PIPELINES 147
Hebden, D. and Foley, K. W. INVESTIGATIONS WITH A SMALL PRESSURE GASIFIER: PART I—THE STUDY OF THE REACTIONS OCCURRING IN THE FUEL BED 23;—Edge, R. F. and Foley, K. W. GASIFICATION UNDER PRESSURE 62
Heck, E. T. FRACTURES AND JOINTS 87
Hedberg, C. W. GAS CLEANING APPARATUS 144;—and Roberts, L. M. GAS CONDITIONING METHOD AND APPARATUS 140
Hedlund, A. W. REFRIGERATION UNIT UTILIZING SOLAR ENERGY 3
Hedrick, J. J. REGULATIONS VS PIPE LINE PRODUCTION 117
Heidger, W. J. See Rothfuss, R. R.

Heim, D. J. PLANNED METER RETIREMENT 108
Heinrich, B. J. See Grimes, M. D.
Heller, F. J. FIRE PROTECTION IN UTILITY LP-GAS INSTALLATIONS 46
Helme, W. CRANE CO. CELEBRATES CENTENNIAL 105;—HOW McLAUGHLIN AND CO. ROASTS "A MAN'S COFFEE" 121
Hemminger, C. E. See Smith, L. B. 48
Hendrickson, J. W. USING AIR AND NATURAL GAS TO DRILL BY ROTARY METHOD 127
Henke, R. W. NOTES ON A SYSTEM FOR RATING PITTING CORROSION 100
Henley, R. H. See Pennington, N. A.
Henning, H. See Folkins, H. O.
Henry, H. M. IS NEW ENGLAND HEADED BACK TOWARD MANUFACTURED GAS? 101
Henry, J. W. See Sparks, H. A.
Henshilwood, C. P. and Patrick, E. A. THE EFFECT OF OPERATING VARIABLES AND PERMEABLE LININGS UPON FURNACE PERFORMANCE 81
Hepburn, G. C., Jr. and Murphy, D. M. PROGRESS IN SIDE-WALL CORING 217
Herbst, R. S. AIR CONDITIONING SYSTEM 58
Herbst, W. A. PREPARATION OF HYDROCARBON SYNTHESIS GAS 7
Hercules Powder Co. See Bewley, T.; Shapleigh, J. H.
Herrman, W. J. WHAT ABOUT RATES WITH NATURAL GAS 2
Hertz, W. NORTH DAKOTA'S FEAST AND FAMINE 1
Herzig, H. L. See Norman, E. A., Jr.
Hess, F. O. AUTOMATION AND THE GAS INDUSTRY 42;—HEAT TREATING APPARATUS 159
Hester, D. V. and Menzie, D. E. DEVELOPMENT OF SUBSURFACE COMBUSTION DRIVE 27
Hettinger, W. P., Jr., Keith, C. D., Gring, J. L. and Teter, J. W. HYDRO-FORMING REACTIONS: EFFECT OF CERTAIN CATALYST PROPERTIES AND POISONS 131
Heybey, W. H. and Reed, S. G., Jr. WEAK DETONATIONS AND CONDENSATION SHOCKS 204
Heyke, J. E. FULBRIGHT BILL SHOULD BE AMENDED 137
Hicks, J. S. See Deutsch, M. L.
Hill, G. R. See Hughes, M. F.
Hill, L. R. See Dickinson, N. L.
Hill, R. M. and Lynch, C. S. PRODUCTION OF INDUSTRIAL GASES 143
Hines, R. A. THIOPHENE CONVERTING PROCESS 147
Hinshelwood, C. N. and Parker, A. REPORT OF THE FUEL RESEARCH BOARD FOR THE YEAR 1954 160
Hiorns, F. J. THE RELATION BETWEEN BRITTLE BEHAVIOR AND THE STRENGTH AND STRUCTURE OF MATERIALS 133
Hirsch, J. H. See McAfee, J.
Hirst, L. L. See Batchelder, H. R.
Hixson, A. N. See Keith, F. W., Jr.
Hoak, R. D. PROCESS FOR USING SULPHATE LIQUORS FOR RECOVERING VALUES FROM COKE OVEN GAS 199
Hoar, R. S. See Pennington, N. A. 78
Hobson, M. and Weber, J. H. PREDICTING VOLUMETRIC BEHAVIOR 219
Hoch, R. S. See Bobo, R. A.
Hock, R. L. USE OF LIGHT HYDROCARBONS FOR BETTER OIL RECOVERY IN NORTH LOUISIANA 217
Hoey, G. R. and LeRoy, D. J. THE MERCURY PHOTOSENSITIZED HYDROGENATION OF PROPYLENE AND THE ACTIVATION ENERGY OF THE REACTION $C_3H_7 + H_2 + C_3H_6 + H$ 170
Hofer, L. J. See McCartney, J. T.
Hoff, J. M., and Wanrer, E. L. AUTOMATIC IGNITION AND CONTROL MECHANISM FOR GASEOUS FUEL BURNERS 3
Hoffman, D. S. and Weber, J. H. VAPOR CONSTANTS FOR BENZENE EQUILIBRIUM 112
Holby, W. H. APPARATUS FOR DETERMINING AND RECORDING THE DUST CONTENT OF FLUE GAS 11
Holcroft, W. FUNDAMENTALS OF GAS CARBURIZING 20
Hollman, P. I. BURNER IGNITER AND SAFETY CONTROL 39;—OVEN LIGHTING SYSTEM 174
Holt, H. von See Massow, H. J., von
Holt, P. F. and King, D. T. THE CHEMISTRY OF SILICA SURFACES 133
Holtz, R. T. PLASTIC PIPE LINKS CRUDE GATHERING SYSTEM 208
Honeyborne, D. B. DIFFERENTIAL THERMAL ANALYSIS AND ITS APPLICATION TO THE STUDY OF BUILDING MATERIALS 204
Hood, A. See Clerc, R. J.
Hood, H. C. NEW BURNERS IN STATE BUILDING PROVE HIGHLY SATISFACTORY 3;—HOW GAS SURVIVED THE A-BOMB TEST 137;—GAS MOVES TO CAPTURE THE SUMMER "VOLUME" LOAD: AIR CONDITIONING 174;—HOW TO SIZE GAS-FIRED HOUSE HEATING EQUIPMENT 175
Hoog, H. See Engel, W. F.
Horland, H. RADIOGRAPHIC INSPECTION OF PETROLEUM PIPE LINES 47
Horn, F. L. See Sheehan, T. V.
Hornaday, G. F. DEHYDRATION BY THE HOUDRY PROCESS 32
Horne, W. A. See McAfee, J.
Horner, W. L. PROPER RESERVOIR EVALUATION PAYS DIVIDENDS IN SUCCESSFUL SECONDARY RECOVERY 91
Horsfall, A. V. SOME TRENDS AND INFLUENCES ON THE DOMESTIC LOAD 117
Horvitz, L. NEAR-SURFACE HYDROCARBONS AND PETROLEUM ACCUMULATION AT DEPTH 46
Hotchkiss, A. G. THEORY OF FURNACE GAS ATMOSPHERES 20;—and Webber, H. M. MODERNIZING WITH PROTECTIVE ATMOSPHERES 20
Houdry Process Corp. See Kollgaard, R.
Hough, F. A. THE GAS INDUSTRY HAS APPROVED ITS NEW SAFETY CODE 27;—THE NEW GAS DISTRIBUTION AND TRANSMISSION PIPING CODE 48;—CHAPTER I OF THE CODE: MATERIALS AND EQUIPMENT 89;—CHAPTER II. WELDING ON COMPLETED PIPE 109;—RELATING DESIGN OF FACILITIES TO THE REQUIREMENTS OF THE LOCATION 127;—CORROSIVITY OF GASES AND SOILS AND THE PREVENTION OF OVER-PRESSURING 181
Hovious, R. L., Morrill, C. D. and Tomlinson, N. P. INDUSTRIAL USES OF ANALOG COMPUTERS 184
Hovland, H. RADIOGRAPHIC INSPECTION ASSURES SOUND PIPELINE WELDS 31;—RADIOGRAPHIC INSPECTION OF PIPE LINE WELDS 100
Howe, R. J. DESIGN OF OFFSHORE DRILLING STRUCTURES 218
Howes, E. A. THE OCCURRENCE AND RECOVERY OF GERMANIUM IN LARGE WATER-TUBE BOILERS 161
Huber, L. and Duerr, W. INTERMITTENT COMBUSTION DEVICE PROVIDED WITH MEANS FOR CONTROLLING THE COMBUSTION GAS FLOW THEREIN 2
Hubmann, O. PROCESS FOR GASIFICATION OF SOLID FUELS 22
Hudson Eng. Corp. See Turner, N. C.
Hudy, J. A. and Mair, R. D. DETERMINATION OF

TRACES OF SULFUR IN ORGANIC COMPOUNDS: VERTICAL FURNACE METHOD 150
Huebotter, E. E., Dunn, T. H. and Bell, F. S. HOW TO SELECT AND USE ROTARY DRILLING FLUIDS 197
Huggins, C. A. APPARATUS FOR CONTACTING GASES AND LIQUIDS 32
Hughen, P. L. INTERNAL CLEANING OF PIPE LINES IN OPERATION. ON-STREAM CLEANING OF GAS PIPELINES 218
Hughes, M. M. and Hill, G. R. RATE LAW AND MECHANISM FOR THE OXIDATION OF CARBON MONOXIDE OVER A VANADIUM OXIDE CATALYST 151
Hughes, T. G. PETROCHEMICAL GROWTH: WILL IT AFFECT OIL AND GAS PRODUCTION? 153
Humphreys, T. G. See Keller, J. E.
Hunt, R. A., Jr. See Zimmerschied, W. J.
Hunter, C. D. DEVELOPMENT OF NATURAL GAS FIELDS OF EASTERN KENTUCKY 197
Hunter, E. E. HOW TO DETERMINE GAS PRODUCTION COST 173
Hunter, G. T. and Clark, G. M. ELECTRONIC DATA-PROCESSING MACHINES 184
Hunter, J. A. SAVE TIME IN VACUUM VESSEL DESIGN 135
Huntington, R. L. See Broaddus, J. E.
Huntington, R. L. See White, P. D.
Hurst, R. E., Moore, J. M. and Ramsey, D. E. "FRAC" TREATMENT MODERN WELL STIMULATION METHOD 163;—and Rollins, J. T. HYDRAULIC FRACTURING IN THE PERMIAN BASIN 163
Hussey, A. S., Sorensen, J. H., and DeFord, D. D. AMMONIUM SULFAMATE AS SUBSTITUTE FOR LEAD PEROXIDE IN MICRODETERMINATION OF CARBON AND HYDROGEN 132
Hutchinson, F. W. 16 EXAMPLES AND SOLUTIONS TO ENERGY EQUATIONS FOR FLOW AND NONFLOW SYSTEMS 186
Hutchinson, S. W. WATER, AIR, AND ENERGY 118
Hutta, J. J. and Griffiths, J. C. DIRECTIONAL PERMEABILITY OF SANDSTONES: A TEST OF TECHNIQUE 218
Hyde, E. H. METHOD AND MEANS FOR TREATMENT OF COAL DISTILLATION GASES AND VAPORS 7
Hydrocarbon Research, Inc. See Garbo, P. W.; Johnson, C. A.; Kalbach, J. C.; Pichler, H. R.
Hixon, F. E. SULFUR AND SULPHURIC ACID FROM PETROLEUM 111

I

Ibele, W. E. See Hall, N. A.
Igoe, J. W. and Rose, H. J. WORLD COAL RESEARCH IN 1954 106
Illinois Testing Lab. See Boyle, J. R.
Imamoto, S. See Munekata, E.
Imperial Chemical Industries Ltd. See Pearce, T. J.
Incandescent Heat Co., Ltd. See Edwards, T.
Ince, H. See Crawford, P. B.
Indep. Natural Gas Assoc. America. INGAA RESOLUTION CALLS FOR CONGRESSIONAL ACTION IN WAKE OF PHILLIPS DECISION 1
Ingber, N. M. See Buchoff, L. S.
Ingram, G. SOME APPLICATIONS OF THE VAN SLYKE MANOMETRIC TECHNIQUE 50
Institute of Gas Technology. See Pettyjohn, E. S.; Riesz, C. H.
Irwin, R. R. PANEL COOLING FOR A RESIDENCE 120

J

Jack, H. R. See Leah, A. S.
Jackson, D. D. TAKE EXTRA CARE IN COMPLETING MEDIUM HIGH-PRESSURE WELLS 85
Jackson, G. W. See Bewley, T.
Jackson, W. D. and Krausse, D. M. IT'S AN EASY ROAD FROM CONVENTIONAL FUELS TO PETROCHEMICALS 185
Jacobson, W. E. FACTS ABOUT PLASTIC PIPE 76;—METHODS OF JOINING PLASTIC PIPE 228
Jacoby, R. H. CALCULATION OF METHANOL REQUIREMENTS TO PREVENT FORMATION OF GAS HYDRATES 87
Jahnig, C. E. See Barr, F. T.
Jamison, L. R. THE APPLICATION OF LOW TEMPERATURE SEPARATORS TO HIGH PRESSURE GAS CONDENSATE PRODUCTION 162
Jaycox, E. K. A SPECTROCHEMICAL PROCEDURE OF GENERAL APPLICABILITY 112
Jenike, A. W. BETTER DESIGN FOR BULK HANDLING 53
Jenkins, G. I. CHEMICAL ENGINEERING DEVELOPMENT IN THE COAL INDUSTRY 192
Jenkins, R. and Aronofsky, J. S. ANALYSIS OF HEAT TRANSFER PROCESSES IN POROUS MEDIA—NEW CONCEPTS IN RESERVOIR HEAT ENGINEERING 109
Jensen, K. S. and Suhr, F. W. FLOOR FURNACE 39
Jessen, F. W. and Miller, J. C. AN INVESTIGATION OF THE USE OF THE SPECTROGRAPH FOR CORRELATION IN LIMESTONE ROCK 86
Jet-Heet, Inc. See MacCracken, C. D.
Johnson, A. J., Liedholm, G. E. and Lowman, M. C. METHOD AND APPARATUS FOR THE PRODUCTION OF SHALE OIL FROM OIL SHALE 91
Johnson, B. H. See Hastings, S. J.; Lumpkin, H. E.
Johnson, C. A. and Schuman, S. C. REMOVAL OF THIOPHENES FROM AROMATIC HYDROCARBONS 167
Johnson, C. W. STOCK WATER HEATER 59
Johnson, F. B. and Wood, R. E. NEW DATA ON FLUID COKING 48
Johnson, F. J. See Dickinson, F.
Johnson, G. A., Friendlander, S. K., Dennis, R., First, M. W. and Silverman, L. PERFORMANCE CHARACTERISTICS OF CENTRIFUGAL SCRUBBERS 155
Johnson Gas Appliance Co. See Johnson, C. E.
Johnson, J. F. See LeTourneau, R. L.
Johnson, M. L. DEGREE DAYS BY INSTRUMENT 121
Johnson, R. GAS INSTALLATIONS SURVIVE A-BOMB 137
Johnson, W. A. HOW TO DESIGN CATHODIC PROTECTION SYSTEMS 100
Johnston, D. W. COMBUSTION TYPE AIR HEATER FOR DRYING PURPOSES 175
Johnston, H. L. See Powers, R. W.
Johnston, R. W. See Martin, J. M., Jr.
Johnstone, H. F. See Gerhard, E. R.
Jones, F. B. TRENDS IN PRODUCTION AND USE OF NATURAL GAS 25
Jones, F. M. METHOD AND MEANS FOR AIR CONDITIONING 59
Jones, G. W. See Zabetakis, M. G.
Jones, H. F. FUTURE METHODS OF GAS PRODUCTION 125
Jones, J. B. and Pyle, C. RELATIVE PERFORMANCE OF SIEVE AND BUBBLE-CAP PLATES 225
Jones, J. H. See Gawley, R. L.
Jones, W. I. NEW PATHS IN SMOKELESS FUEL PRODUCTION 123
Jorczak, J. S. and Dworkin, D. POLYSULFIDE LIQUID POLYMERS 171
Jordan, R. C. See Threlkeld, J. L.
Judah, M. A. NACE MEETING MARKS ITS FIRST TEN YEARS 116;—HOW 36-INCH PIPE IS PICKLED AND COATED 136
Juenker, D. W., Van Swaay, M. and Birchenall, C. E. ON THE USE OF PALLADIUM DIFFUSION MEMBRANES FOR THE PURIFICATION OF HYDROGEN 223

Jungnickel, J. L. See Peters, E. D.
Junker, H. J. See Dahme, A.

K

Kafka, E. M. See Segeler, C. G.
Kalbach, J. C. GASIFICATION OF SOLID CARBONACEOUS MATERIALS 63
Kalish, H. S. and Mazza, E. N. AN EVALUATION OF DISSOCIATED AMMONIA AND HYDROGEN ATMOSPHERES FOR SINTERING STAINLESS STEEL 82
Kalish, P. P. OPTIMUM CONDITIONS FOR MULTISTAGE 66
Kammermeyer, K. See Hancher, C. W.
Kanehann, J. A. See Childs, E. B.
Karr, C., Jr., Weatherford, W. D., Jr., Kendrick, T. J. and Capell, R. G. CHROMATOGRAPHIC FRACTIONATION OF TOTAL CRUDE SHALE OIL 71
Karwat, E. and Linde, R. PROCESS FOR COOLING AND PURIFYING COMPRESSED GAS MIXTURES 97
Kaskan, W. E. and Noreen, A. E. HIGH-FREQUENCY OSCILLATIONS OF A FLAME HELD BY A BLUFF BODY 60
Kendrick, T. R. See Karr, C., Jr.
Kaser, A. See Winet, H.
Katz, D. L., Young, E. H. and Balekjian, G. CONDENSING VAPORS ON FINNED TUBES 54;—Myers, J. F., Young, E. H. and Balekjian, G. BOILING-OUTSIDE FINNED TUBES 97;—Young, E. H., Williams, R. B. and Balekjian, G. HOW TO DESIGN ATMOSPHERIC COOLERS 97; See Williams, R. B.
Katzen, R. COPPER AND COPPER ALLOYS 15
Kayan, C. F. REFRIGERATING-PLANT PERFORMANCE CHARACTERISTICS BY ELECTRICAL ANALOG ANALYSIS 139
Kaye, W. I. See Patton, H. W.
Kayse, J. R. HIGH TEMPERATURE PSYCHROMETRIC CHART FOR HUMID AIR 119
Keane, C. C. WHAT'S NEW IN PIPELINE ELECTRONICS 85
Kear, R. W. THE EFFECT OF HYDROCHLORIC ACID ON THE CORROSIVE NATURE OF COMBUSTION 187;—LOW TEMPERATURE CORROSION BY FLUE-GAS CONDENSATES 191
Kebely, V. See Summerfield, M.
Keenan, J. H. See Keyes, F. G.
Kehn, D. M. See Akers, W. W.
Keith, C. D. CHEMICAL MANUFACTURE 14; See Hettinger, W. P., Jr.
Keith, F. W., Jr. and Kixson, A. N. LIQUID—LIQUID EXTRACTION SPRAY COLUMNS 97
Keller, J. E., Humphreys, T. G., and Campbell, C. D. GAS AND PETROLEUM INDUSTRIES ARE DEVELOPING INDUSTRIAL RADIO 85
Kelley, G. A. and Rahm, H. E. AIR CONDITIONER 58
Kelley, R. E. See Akers, W. W.
Kelley, R. G. PERFORATED PLATES VERSUS BUBBLE CAPS 154
Kellner, H. L. See Easly, J. C.
Kellogg Co., M. W. See Dickinson, N. L.; Palmer, G. H
Kelly, F. W., Jr. PETROLEUM EXPLORATION WITH RADIO WAVES 163
Kendrick, C. L. See Riggen, D. M.
Kennedy, F. G., III, Chancellor, J. N., Jr. and Rahmes, M. H. HOW'S YOUR ABSORBER EFFICIENCY 154
Kennedy, G. F. and Margen, P. H. ECONOMIC DESIGN AND SELECTION OF COOLING TOWERS 206
Kent, T. B. A HYDROGEN PIRANI LEAK DETECTOR USING A CHARCOAL TRAP 156
Kerr, A. J. HOW R/A WELL LOGGING IS USED IN WEST TEXAS 108
Ketchum, E. R. CALCULATING FORCES DUE TO A "SNAKE" OF PIPING 89
Keyes, F. G. THERMAL CONDUCTIVITY OF GASES 72;—and Keenan, J. H. THE PRESENT STATUS OF STEAM PROPERTIES 55
Kharbanda, O. P. ONE NOMOGRAM SOLVES SEVERAL PROBLEMS 14;—VAPOR-LIQUID EQUILIBRIA FOR PARTIALLY MISCIBLE BINARY SYSTEMS 226
Kiff, P. R. See Dixon, B. E.
Kik, A. J. GAS BURNER AND PILOT MEANS THEREFOR 119
Kilberg, A. C. HOW POLYVINYL CHLORIDE TAPE IS USED IN CORROSION MITIGATION PROGRAMS 136
Kilday, M. V. See Shepherd, M.
Kilgore, C. H. See Akers, W. W.
Kimmel, M. L. See Hawkins, M. F., Jr.
King, D. T. See Holt, P. F.
King, G. R. INSTALL MODERN CATALYTIC REFORMERS 212
King, J. G. INTERNATIONAL METHODS OF ANALYSIS OF SOLID FUELS 204
King, R. O., Sandler, S., and Strom, R. THE OXIDATION, DECOMPOSITION, IGNITION, AND DETONATION OF FUEL VAPORS AND GASES, XXVI. THE EFFECT OF FLOW CONFIGURATION ON THE OXIDATION AND IGNITION OF HYDROGEN IN MIXTURES WITH AIR SUPPLIED TO VERTICAL COMBUSTION TUBES OF VARIOUS MATERIALS 211
Kirby, R. A. See Dryden, I. G.
Kirk, E., Jr. THE CHARCOAL WEIGHT TEST 149
Kirkby, W. A., Lakey, J. R. and Sarjant, R. J. A STUDY OF COAL EXTRACTS BY INFRARED SPECTROSCOPY 22
Kirkpatrick, C. V. FUNDAMENTALS OF GAS LIFT 10;—GAS-LIFT VALVE SPREAD: HOW TO FIND IT 87
Kleinschmidt, L. R. CHROMATOGRAPHIC METHOD FOR THE FRACTIONATION OF ASPHALT INTO DISTINCTIVE GROUPS OF COMPONENTS 132
Klingenberg, A. HEAT TRANSFER IN CROSS-FLOW HEAT EXCHANGERS AND PACKED BEDS 54;—DIMENSIONAL SYSTEMS AND SYSTEMS OF UNITS IN PHYSICS WITH SPECIAL REFERENCE TO CHEMICAL ENGINEERING, PART II PRACTICAL RULES FOR AUTHORS AND READERS 206
Klinkert, H. G. and Penning, H. M. SHELL "TRICKLIE" HYDRODESULFURIZER 219
Klohn, C. H. GAS-PIPELINE-NETWORK FLOW CALCULATIONS 180
Klohr, J. W. See Smalley, G. E.
Knapsack-Friesheim AG See Walter, F.
Kobayashi, R. See Carr, N. L.
Kobayasi, K. THE EVAPORATION VELOCITY OF SINGLE DROPLETS OF LIQUIDS 30
Kobe, K. A. See Leland, T. W., Jr.
Koch, C. W. See Gabourel, J. D.
Koch Eng. Co. See Huggins, C. A.
Koebbeman, R. F. and McCammant, L. H. CHAIN IGNITION 39
Koebel, N. K. PRACTICAL APPLICATION OF EQUILIBRIUM RELATIONSHIPS TO HEAT TREATING IN CONTROLLED ATMOSPHERES 42
Koegel, W. G. ABSORPTION REFRIGERATION SYSTEM 18
Koelbel, H. and Ackermann, P. PROCESS FOR CATALYTIC REDUCTION OF CARBON DIOXIDE WITH HYDROGEN 10
Koenig, C. F. III CENTRIFUGAL PIPELINE COMPRESSORS 24
Koenigsberg, E. See Goland, M.
Koger, W. C. CATHODIC PROTECTION OF TREATING EQUIPMENT 136;—HOW TO REDUCE CORROSION IN PRODUCTION OPERATIONS 198

Kollgaard, R. METHOD AND APPARATUS FOR ELEVATING GRANULAR MATERIAL 205
Koppers Co., Inc. See Linder, W.; Totzek, F.; Sachsse, H.
Kowalczyk, L. S. THERMAL CONDUCTIVITY AND ITS VARIABILITY WITH TEMPERATURE AND PRESSURE 184
Kraemer, P. W. SERVICE ANALYSIS MODERN STYLE. 118
Kramers, H. See Lynn, S.
Kratzer, M. B. PREPARATION OF HIGHLY ACTIVE HYDROCARBON SYNTHESIS CATALYST 110
Krausse, D. M. See Jackson, W. K.
Krebill, F. K. See Stewart, F. M.
Krebes, R. W. PRODUCTION OF COKE AGGLOMERATES 166
Kreider, R. E. BOMB-VOLUMETRIC METHOD FOR SULFUR IN REFINED PETROLEUM PRODUCTS 50
Krejci, J. C. See Cines, M. R.
Krick, I. B. A VITAL RELATIONSHIP: WEATHER AND THE GAS REQUIREMENT 128
Krieble, E. L. GAS CLEANER 87
Kroeger, C. V. HOW TESTING AIDS MERCHANDISING 2;—A PEAK SHAVING AID: CAVERN STORAGE FOR LP-GAS 88;—ECONOMICS AND ENGINEERING OF STORING LP—GAS IN SALT FORMATIONS 199; See McCafferty, D. W.
Kroeker, S. P. See Lovelady, I. W.
Kulman, F. E. CAUSES OF FERROUS PIPE CORROSION 156
Kunz, K. S. and Tixier, M. M. TEMPERATURE SURVEYS IN GAS PRODUCING WELLS 182
Kurata, F. See Davis, P. C.
Kurz, P. F. FLAME-STABILITY STUDIES ON AN INVERTED BUNSEN BURNER 81;—FLAME STABILITY STUDIES WITH HYDROCARBON MIXTURES 190; See Levy, A.
Kutchke, K. O. See Sheep, A.
Kuykendall, J. K. FEDERAL REGULATION ON NATURAL GAS 37
Kyle, R. T. See Stookey, K. W.

L

Lacey, W. N. See Stewart, D. E.
L'Air Liquide See Bonnaud, H.; Etienne, A.
Lakey, J. R. See Kirby, W. A.
Lamar, C. C. GAS VALVE 119
Lamb, G. G. See Reitzer, B. J.
Lambdin, W. J. See Yarbrough, V. A.
Lambert, J. A. See Hamann, S. D.
Lambert, J. L., Yasuda, S. K. and Grother, M. P. COLORIMETRIC DETERMINATION OF SULFATE ION 150
Lancaster, D. E. WHAT CONSTITUTES A SOUND MAIN EXTENSION POLICY 66
Landis & Gry, A. G. See Winet, H.
Lang, J. F. See Cronin, W.
Lankford, J. D. NORTH DAKOTA TODAY: A STATUS REPORT 127
LaQue, F. L. CORROSION RESISTANCE OF CUPRONICKEL ALLOYS CONTAINING 10 to 30 PERCENT NICKEL 36;—ATTENTION TO CORROSION IN THE U. S. A. 227
Larson, G. L. See Akerman, J. R.
Lashof, T. W. See Brombacher, W. G.
Latta, J. E. See Pearce, F. G.
Latvin, S. See Bonvillian, C. A.
Laube, H. L., Diehl, A. E., Gonzalez, R. A., toe-Lare, C. M., Faigen, B., and Beemsterboer, P. B. AIR CONDITIONER CONFERENCE 78
LaViolette, W. A. A REMOTE CONTROL OF REGULATOR STATIONS 129
LEAH, A. S., Godrick, and Jack, H. R. RADIATION AND CHEMILUMINESCENCE FROM EXPLOSION FLAMES OF CARBON MONOXIDE 121
Ledent, M. P. See Venter, M. J.
Lee, C. S. See Bonilla, C. F.
Lee, C. Y. and Wilke, C. R. MEASUREMENTS OF VAPOR DIFFUSION COEFFICIENT 29; See Wilke, C. R.
Leffer, F. A. METHOD AND APPARATUS FOR THE CONTINUOUS CONTACTING OF SUBDIVIDED SOLID PARTICLES SUCCESSIVELY WITH AT LEAST THREE FLUID REACTANT STREAMS 74
Leger, E. E. See Millard, B.
Lehane, T. J., Smith, W. M. and Ernst, R. D. SPACE HEATING SYSTEM 3
Lehrer, E. See Sachsse, H.
Leigh, C. H., Dzwarc, M. and Bigeleisen, J. THE RATE OF DECOMPOSITION OF ETHANE INTO METHYL RADICALS 152
Leisey, F. A. COULOMETRIC TITRATIONS AUTOMATIC TITRATOR FOR MERCAPTANS 28
Leland, T. W., Jr., McKetta, J. J., Jr. and Kobe, K. A. PHASE EQUILIBRIUM IN 1-BUTENE-WATER SYSTEM AND CORRELATION OF HYDROCARBON-WATER SOLUBILITY DATA 184
LeMay, R. C. FLAME GEOMETRY AIDS HEAT PROCESSING 192
Lennox Furnace Co. See Smoot, T. H.
LeRoy, D. J. See Hoey, G. R.
Lesher, E. J. See Sherlock, R. H.
Lester, C. B. HYDRAULICS FOR PIPELINERS: WORKING STRESSES 146
LeTourneau, R. L., Johnson, J. F. and Ellis, W. H. REDUCED-SCALE REID VAPOR PRESSURE APPARATUS 71
Leva, M. and Wem, C. Y. ABSORPTION AND HUMIDIFICATION 134
Levin, H. PETROLEUM 167; See Pomatti, R. C.; Swearingen, J. S.
Levorsen, A. I. POSSIBLE FUTURE PETROLEUM PROVINCES 163
Levy, A. METALS FOR SHORT-TIME SERVICE AT HIGH TEMPERATURES 135;—KINETICS OF THE HYDROGEN - OXYGEN - METHANE SYSTEM. I. INHIBITION OF THE SECOND EXPLOSION LIMIT 191;—and Kurz, P. F. AN ANALYSIS OF THE STABILITY OF CARBON MONOXIDE - HYDROCARBON AIR FLAMES 103;—and Foster, J. F. KINETICS OF THE HYDROGEN-OXYGEN - METHANE SYSTEM. II. THE SLOW REACTION 191
Lewis, C. H. See Grant, A. F.
Lewis, J. S. See Patton, H. W.
Lieberg, O. S. HIGH TEMPERATURE WATER: PART I. BASIC ELEMENTS 210
Liedholm, G. E. See Johnson, A. J.
Life, W. E. See Brooks, T. P.
Linde, R. See Karwat, E.
Linden, H. R., Reid, J. M., Bair, W. G. and Pettyjohn, E. S. INITIAL OPERATION OF A FOUR-SHELL CYCLIC REGENERATIVE PRESSURE OIL GAS PILOT UNIT 126: See Dirksen, H. A.; Pettyjohn, E. S.; Reid, J. M.
Linder, W. METHOD AND APPARATUS FOR THE PRODUCTION OF COMBUSTIBLE GASES FROM LIQUID FUELS 195
Link, T. A. and Downing, J. A. ALBERTA AND BRITISH COLUMBIA 197
Linn, E. H. FUTURE POSSIBILITIES IN THE APPALACHIAN BASIN 198
Linton, W. J., Jr. See Gee, R. E.
Linz, B. F. FPC LEAVES GAS PRODUCERS IN DARK 37;—GAS PRICES NEAR PEAK 157
Lipscom, T. G. See Akers, W. W.
Lisk, R. C. GAS IN THE ATOMIC AGE 127
Livovich, A. F. FACTORS INFLUENCING THE PHYSICAL PROPERTIES OF REFRACTORY CONCRETES 16
Lloyd, W. G. and Taylor, F. C., Jr. CORROSION BY AND DETERIORATION OF GLYCOL AND CLYCOL-AMINE 35

Lockett, D. E. See Fuller, L. S.
Logsdon, R. F. See Moore, C. E.
Lohman, P. H. COMPETITION: OUR BEST BET FOR GAS PRODUCTION 101
Long, C. W. TURNAROUND PRESSURE VESSEL INSPECTION 115
Long, D. R. and Neuzil, R. W. DETERMINATION OF OLEFINS BY MEANS OF IODINE COMPLEXES, ULTRAVIOLET ABSORPTION METHOD 221
Longnecker, D. R. See Boggs, H. D.
Longwell, J. S. and Weiss, M. A. HIGH TEMPERATURE REACTION RATES IN HYDROCARBON COMBUSTION 191
Lorenzi, R. J. See Bailey, G. B.
Lossberg, von L. G. See Powell, S. T.
Lossing, F. P. See Farmer, J. B.
Loundsbury, I. R. INFRARED ANALYZER IN AMMONIA PLANTS 135
Lovelady, I. W. and Kroeker, S. P. GAS AND MULTIPLE LIQUID SEPARATOR APPARATUS 145
Lovell Manufacturing Co. See Smith, E. H.
Lowe, F. W. See Poindexter, F. E.
Lowman, M. C. See Johnson, A. J.
Loyles, R. O. and Walker, J. W. HEATER FOR LIVESTOCK WATERING TANKS 175
Lucas, T. A. INSTRUMENTATION IN THE GAS INDUSTRY 55
Ludwig, E. E. See Wilson, J. E.
Lumpkin, H. E. and Johnson, B. H. IDENTIFICATION OF COMPOUND TYPES IN A HEAVY PETROLEUM GAS OIL 50
Lupien, Y. See Whalley, E.
Lurie, P. C. See Riesz, C. H.
Luther, M. W. See Harper, J. I.
Luthy, R. V. See Egan, C. J.
Lykken, H. G. APPARATUS FOR PRODUCING LIGNITE FUEL PRODUCT 142
Lyles, H. R. CITIES SERVICE IMPROVES OPERATION REDUCES COSTS 114
Lyman, A. L. WHAT WE'LL BE MAKING IN 10 YEARS 131
Lynch, C. S. See Hill, R. M.
Lynn, C. V. PROTECT YOUR TANK INVESTMENTS 115
Lynn, S., Straatemeier, J. R. and Kramers, H. ABSORPTION STUDIES IN THE LIGHT OF THE PENETRATION THEORY. I. LONG WETTED-WALL COLUMNS 134;—II. ABSORPTION BY SHORT WETTED-WALL COLUMNS 154;—ABSORPTION BY WETTED SPHERES, SINGLY AND IN COLUMNS 154

M

MacCracken, C. D. BURNER FOR LIQUID AND GASEOUS FUELS 3
Mac Donald, A. C. HOT FACE INSULATION ON INTERMITTENT KILNS 228
Machelson, S. G. UNDERGROUND GASIFICATION OF COAL 84
Mackie, D. M. THE FIELD THAT LEARNED TO BREATHE 165
Macorsky, S. L. THERMAL DEGRADATION OF POLYMERS AS A FUNCTION OF MOLECULAR STRUCTURE 53
Maffezzoni, U. ACIDO CIANIDRICO E NITRILE ACRILLO DA METANO (HYDROGEN CYANIDE AND ACRYLONITRILE FROM METHANE) 24
Magner, H. G. PROGRESS OF AIR GAS DRILLING IN THE APPALACHIAN AREA 197
Magner, H. J. LOST CIRCULATION AND COMPLETION PROBLEMS EASED 65; AIR-GAS, TOP TO BOTTOM 216
Maier, R. E. See Gee, R. E.
Maingot, G. J. See Coope, J. R.
Mair, R. D. See Hudy, J. A.
Major, C. J. CHARTS FOR PRESSURE VESSEL DESIGN 135
Manes, M. See Farnsworth, J. F.
Mangold, G. B. A NEW TYPE OF FORMATION CORRELATION 86
Mann, C. P. HEAT PROCESSING COMBUSTIBLE MATERIAL 105
Mapstone, G. E. See Grosberg, J. A.; Nottes, E. G.
Marble, G. E. DESIGN FOR SUCCESSFUL COMMERCIAL INCINERATION 59
Marcadet, J. See Vichnievsky, R.
Margen, P. H. See Kennedy, G. G.
Marki, A. R., George, H. H. and Rodabaugh, E. C. PRESSURE-PULSATION TESTS OF BRANCH CONNECTIONS TO LARGE-DIAMETER PIPE 129
Markle M. G. PROTECTION OF DISTRIBUTION SYSTEMS 136
Marks, C. B. See Tenney, W. L.
Marlow, S. VENTILATION OF COMMERCIAL LAUNDRIES 21
Marshall, W. H., Jr. See Eickmeyer, A. G.
Martell, A. E. and Charberek, S. USE OF CHELATING AGENTS AS REAGENTS IN TITRIMETRIC ANALYSIS 28
Martin, E. R. GAMMA SEES '55 SALES RISE 102
Martin, G. H. ASSEMBLY LINE METER REPAIR 128
Martin, J. M., Jr., Johnston, R. W. and O'Neal, M. J., Jr. QUANTITATIVE ANALYSIS OF AROMATIC HYDROCARBONS IN THE 2- to 25-MICRON INFRARED REGION 49
Martin, M. WITH THE MICROLOG YOU CAN BE SURE 217
Martin, R. I. HOW INDUCTION LOGS WORK 87
Matrius, U. M. MODERN X-RAY TECHNIQUES AT THE ONTARIO RESEARCH FOUNDATION 150
Marx, P. C. See Worthington, A. E.
Mascolo, R. W. See Summerfield, M.
Masing, B. HEAT EXCHANGE UNIT OF AN ABSORPTION REFRIGERATING APPARATUS 59
Mason, P. W. ALL-ELECTRIC CONTROL OF CRUDE-DISTILLATION UNITS 90
Mason, R. B. See Smith, L. B.
Massow, von H. J. and von Holt, D. DEVELOPMENTS AND FEATURES OF HIGHER COKE OVEN CHAMBERS 161
Matheny, F. M. PIPE LINING DRAG DEVICE 208
Matthews, H. See Medkeff, R. J.
Mattix, E. D. REDUCE YOUR INSTRUMENT MAINTENANCE 99
Mattox, R. W. See Powers, R. W.
Mayland, B. J. DESULFURIZATION IN THE GASIFICATION OF COAL 7
Mazza, E. N. See Kalish, H. S.
McAfee, J., Montgomery, C. W., Summers, C. R. Jr., Hirsch, J. H. and Horne, W. A. THE GULF HDS PROCESS FOR UPGRADING CRUDES AND RESIDUES 147
McAmis, J. W. ORGANIZATION AND ACTIVITY OF THE CORROSION CONTROL GROUP OF A LARGE PUBLIC UTILITY 227
McBrien, J. H. HOT TAPPING COMES OF AGE 87
McCabe, L. C. ATMOSPHERIC POLLUTION 120
McCafferty, D. W. HOW TO PREDICT GAS MAIN CAPACITY 218
McCammant, L. H. See Koebbeman, R. F.
McCarthy, J. W. RECOVERY OF ELEMENTARY SULFUR FROM GASES 143
McCarthy, R. See Moore, C. E.
McCartney, J. T. and Hofer, L. J. MICROREFLECTIVITY ANALYSIS OF COAL 193
McClure, C. INTERNAL CLEANING OF PIPELINES WITH DETERGENTS 129;—SOAP AND WATER CLEAN DIRTY PIPELINES TOO 180
McClure, G. M. See Abraham, E. D.
McCormick, G. C. UTILIZATION OF INSULATING REFRACTORY LININGS IN SLOT-TYPE FORGE

FURNACES 81
McCoskey, R. E. See Douglas, T. B.
McCoy, R. N. APPLICATION OF CATALYTIC DESULFURIZATION TO GROUP SULFUR ANALYSIS PETROLEUM FRACTIONS 50
McCray, G. W. PRECAUTIONS TO PREVENT BLOWOUTS 90
McCully, G. See Caule, E. J.
McDowell, J. M. PERFORMANCE OF WATER DRIVE RESERVOIRS, INCLUDING PRESSURE MAINTENANCE, AS DETERMINED BY THE RESERVOIR ANALYZER 165
McEachern, D. J. CANADIAN FIELD GETS GAS INJECTION SYSTEM 109
McEachron, K. B., Jr. NEW CONCEPT IN REFRIGERATOR DESIGN 175
McGhee, E. DRILL FASTER WITH AIR 86
McGuckling, J. GAS OVER OIL FOR RESIDENTIAL HEATING 80
McGurl, G. V. and Fleming, G. L. THE KOPPERS-HASCHE REFORMER 179; See Fransworth, J. F.
McKane, R. H. See Perry, L. C.
McKay, A. S. See Egan, E. E.
McKean, J. B. See Stanier, H.
McKetta, J. J., Jr. See Leland, T. W., Jr.
McKinnis, A. C. PRODUCTION OF HYDROGEN CYANIDE 224
McLaughlin, E. R. See Ross, W. L.
McLean, G. O. THE DUAL-PURPOSE DOMESTIC HEAT PUMP 138
McLeod, D. L. THE ECONOMICS OF PLANNED METER RETIREMENT 108
McNally, A. J. TURRET-TYPE GAS BURNER 39
McWaters, R. J. See Shepard, A. P.
Medkeff, R. J. and Mathews, H. SOLVING PROCESS-CONTROL PROBLEMS BY ANALOG COMPUTER 53
Meeker, R. F. See Pomatti, R. C.
Mei, A. J. See Cametti, B.
Melborn, J. PROTECTIVE LININGS FOR CORROSIVE MATERIALS 208
Melpolder, F. W., Brown, R. A., Washall, T. A., Doherty, W. and Young, W. S. ANALYSIS OF LUBRICATING OIL BY THERMAL DIFFUSION AND MASS SPECTROMETRY 50
Menard, H. and Blossom, E. D. ADVANTAGES OF LATENT COOLING OF COMPRESSORS 196
Menneer, J. HYDRAFRAC SUCCESS 198
Menzie, D. W. See Hester, D. V.
Merrit, J. W. HOW TO AVOID COSTLY ERRORS IN GAMMA RAY SURVEYING 198
Meyer, L. W. and Scogin, R. J. LONG-TERM CREEP OF PIPE EXTRUDED FROM TENITE BUTYRATE PLASTIC 116
Meyer, W. M. See Yellott, J. I.
Miao, Y. M., Price, T. W., and Potter, J. H. TRANSIENT GAS-FLAME TEMPERATURES IN A SPHERICAL BOMB 60
Mihara, K. See Munekata, E.
Milam, P. B. FLEXIBLE JOINT FOR PIPE 15
Milbourne, C. G. and Spengler, W. E. PROCESS AND APPARATUS FOR MAKING FUEL GAS 178
Millard, B., Caswell, E. G., Leger, E. E. and Mills, D. R. THE ADSORPTION AND HEATS OF ADSORPTION OF WATER ON SPHERON 6 AND GRAPHON 222
Millard, D. J. A STUDY OF TEMPERATURE CONDITIONS IN A COKE OVEN 193
Miller, B. WILL ADDED STEAM GIVE ECONOMICAL POWER BOOST TO GAS TURBINES? 42
Miller, C. B., Jr. HOW STABLE IS SHALE OIL GASOLINE 111
Miller, C. P. See Gent, L. L.
Miller, E. See Folkins, H. O.
Miller, E. C. INFRARED GAS ANALYZER 183
Miller, H. W. See Witt, G.
Miller, J. C. See Jessen, F. W.
Miller, J. F. See Drushel, H. V.
Miller, L. A. See Witt, G.
Miller, R. See Fiske, C. E.
Miller, R. O. FLAME PROPAGATION LIMITS OF PROPANE AND n-PENTANE IN OXIDES OF NITROGEN 191
Milligan, T. J. PURIFICATION OF ACETYLENES 205
Mills, C. A. REFLECTIVE RADIANT CONDITIONING CAN PROVIDE MORE COMFORT AT LESS COST 58
Mills, F. E. and Prigg, J. A. UTILIZATION OF METHANE 26
Milner, C. P. and Power, H. H. SURFACTANT INFLUENCE ON FLOOD RECOVERY 201
Milwaukee Gas Specialty Co. See Cretzler, D. J.
Min, T. C. See Schutrum, L. F.
Minchin, L. T. MILD CARBON MONOXIDE POISONING AS AN INDUSTRIAL HAZARD 19;—METHANE FROM COAL MINES—THE PRESENT POSITION 45
Mindler, A. and Paulson, C. F. ION EXCHANGE: UNIT OPERATION ON THE MOVE 54
Miner, I. O. THE DALL FLOW TUBE 76
Miners, L. A. See Hartwick, E. F.
Minneapolis-Honeywell Regulator Co. See Porter, L. E.; Smith, J. W.
Mize, W. W. GAS DEHYDRATION TODAY, OPERATOR'S COMMENTS; See Gravis, C. K.; Paredes, F.
Moen, W. B. and Shepherd, T. L. FLAME-STABILIZED OXY-FUEL GAS BURNERS 61
Moignard, L. A. THE EFFICIENT OPERATION OF OXIDE PURIFIERS 215
Monkman, J. L. GAS CHAMBER MICROAPPARATUS IN IDENTIFICATION OF AIR-BORNE POLLUTANTS 148
Monrad, C. C. See Rothfus, R. R.
Montgomery, C. W. and Weinberg, E. B. SYNTHESIS GAS MANUFACTURE 63; See McAfee, J.
Montgomery, P. H. HOW TO CONSTRUCT UNDERGROUND GAS STORAGE 109
Moody, G. B. CALIFORNIA OIL: ITS GEOLOGICAL RELATION AND PRODUCTIVE HISTORY 68
Mooney, C. V. See Dotterweich, F. H.
Moore, C. E., McCarthy, R. and Logsdon, R. F. A PARTIAL CHEMICAL ANALYSIS OF ATMOSPHERIC DIRT COLLECTED FOR STUDY OF SOILING PROPERTIES 19
Moore, J. M. See Hurst, R. E.
Moore, R. I. SELECTION OF AN OPTIMUM OPERATING PRESSURE FOR A MEDIUM PRESSURE DISTRIBUTION SYSTEM 196
Morrill, C. D. See Hovious, R. L.
Morse, A. J. See Broaddus, J. E.
Morse, R. A. See Craig, F. F., Jr.
Morrisey, N. BETTER SEISMIC INTERPRETATION NEEDED 86
Morrisey, N. S. ELLENBURGER, IT'S A MAGIC WORD IN WEST TEXAS 69
Moses, D. V. PREPARATION OF CARBON MONOXIDE AND HYDROGEN BY PARTIAL OXIDATION OF CARBONACEOUS SOLIDS 195;—and Thayer, V. R. PREPARATION OF SYNTHESIS GASES 63; See Peery, L. C.
Mott, R. A. and Turner, R. W. THE SIZE REDUCTION AND SAMPLE-DIVISION OF THE MOISTURE SAMPLE OF COKE FOR GENERAL ANALYSIS 221; See Barker, J. E.
Moulton, R. W. See Buckham, J. A.
Moulton, R. W. See Ore, F.
Mueller, A. C. THERMAL DESIGN OF SHELL-AND-TUBE HEAT EXCHANGERS FOR LIQUID-TO-LIQUID HEAT TRANSFER 155
Mueller, E. H. DOUBLE OUTLET CONTROLLING VALVE WITH POSITION INDICATOR 174
Mueller, F. H. GAS PRESSURE REGULATOR 174
Mueller, J. C. See Zylstra, J. J.

Mueller, R. H. INSTRUMENTATION 75;—PORTABLE APPARATUS ANALYSIS MULTICOMPONENT MIXTURES BY FRACTIONAL SEPARATION OF VAPORS IN PARTITION COLUMN 149
Mundth, L. K. and Buell, E. H. WHAT SIZE MAIN NOW 180
Munekata, E., Imamoto, S., Mihara, L. AMMONIA RECOVERY FROM CUPRAMMONIUM RAYON WASTE LIQUORS 168;—METHOD OF RECOVERING AMMONIA FROM DILUTE AQUEOUS SOLUTIONS OF GASES CONTAINING THE SAME 168
Munger, H. P. ATMOSPHERIC CONTAMINANT COLLECTOR 83
Murnaghan, A. R. See Bond, R. L.
Murphree, E. V. THE ATOM IN PEACE 189
Murphy, D. M. See Hepburn, G. C., Jr.
Murray, E. G. ADJUSTABLE ORIFICE GAS-AIR MIXER NOZZLE 3
Murray, R. HOW SIZE AND INSTALL GAS WATER HEATERS CORRECTLY 103
Murray, T. B. and Whalley, W. C. TEMPERATURES AND THERMAL CONDUCTIVITY OF THE GROUND ALONG THE ALIGNMENT OF THE 30-INCH PIPELINE KIRKUK-BANIAS IN RELATION TO OIL TEMPERATURES 47
Myers, J. F. See Katz, D. L.
Myler, W. M., Jr. AFTER-MIX SCHEME TEMPERS MAKE-UP AIR FOR FOUNDRY 82

N

Nagel, R. H. ALCOHOL SYNTHESIS PROCESS 96
Nation, J. H. and Westbrook, S. S. FORMATION FLUIDS CORRODING YOUR CASING? 198
National Assoc. Corrosion Engrs. SULFIDE CORROSION CRACKING OF OIL PRODUCTION EQUIPMENT 56
National Container Corp. See Wilkins, C. W.
Naubereit, H. See Donsky, A.
Neaves, C. MUFFLER, ACOUSTIC MATERIALS AID PRESSURE STATION NOISE ABATEMENT 219
Nedelman H. TECHNIK UND WIRTSCHAFT DER KOHLENCHEMIE (TECHNOLOGY AND ECONOMICS OF COAL CHEMISTRY) 160
Nelson, C. R. and Courter, M. L. ETHANOL BY HYDRATION OF ETHYLENE 13
Nelson, H. W. PROBLEMS OF CAKING IN THE COMPLETE GASIFICATION OF BITUMINOUS COALS 213
Nelson, J. B. X-RAY STUDIES OF THE ULTRAFINE STRUCTURE OF COAL II—ATOMIC DISTRIBUTION FUNCTIONS OF VITRINITE FROM BITUMINOUS COALS 21
Nesbitt, R. H. See Burwell, E. B., Jr.
Neu, J. T. See Barusch, M. R.
Neuhaus, A. THEORETICAL PRINCIPLES OF DIAMOND SYNTHESIS 51
Neumaier, B. W. and Schilmoller, C. M. HOW RICHFIELD TACKLED HYDROGEN BLISTERING 188
Neuzil, R. W. See Long, D. R.
Nevers, A. D. HOW ODORANTS ARE EVALULATED BY USE OF NEW APPARATUS 93
Newby, B. J. See Grimes, M. D.
Newell, A. See Anderson, H. C.
Newman, L. L. DEVELOPMENTS IN THE OXYGEN GASIFICATION OF SOLID FUELS ON THE AMERICAN CONTINENT 213
Nicholson, E. W. HYDRODESULFURIZATION OF HEAVY OILS 219
Nicholson, G. A. and Schneider, W. G. COMPRESSIBILITY OF GASES AT HIGH TEMPERATURES IX. SECOND VIRIAL COEFFICIENTS AND THE INTERMOLECULAR POTENTIAL OF NEON 113
Nickel, W. GAS COMES TO SOUTHEAST ALABAMA 64
Nielsen, R. F. SHORT CUTS FOR FINDING RELATIVE PERMEABILITIES 89; 109
Nier, A. O. DETERMINATION OF ISOTOPIC MASSES AND ABUNDANCES BY MASS SPECTROMETRY 152
Nisle, R. G. and Poettmann, F. H. CALCULATION OF THE FLOW AND STORAGE OF NATURAL GAS IN PIPE 65
Noble, E. D. DETERMINATION OF TRACE KJELDAHL NITROGEN IN PETROLEUM STOCKS 222
Noeggerath, W. GENERAL ENTHALPY-TEMPERATURE-ENTROPY DIAGRAM FOR IDEAL GASES AND GAS MIXTURES UP TO 5000° K. 223
Nolan, J. E. ANALOG COMPUTERS AND THEIR APPLICATION TO HEAT TRANSFER AND FLUID FLOW 54
Noreen, A. E. See Kaskan, W. E.
Norman, E. A., Jr., Reichelderfer, C. A., Herzig, H. L. and Raymer, H. G. FORCED-AIR, FORCED-DRAFT UNIT HEATER 39
Noser, W. P. PLACING GROUND CONTACT ANODES WITH A HIGH VELOCITY WATER JET 207
Nottes, E. G. and Mapstone, G. E. WHAT ARE PROSPECTS IN AUSTRALIA? 130

O

Odasz, F. B. and Sheffield, J. V. DIESULFORMING OPERATES THIS WAY 219
Odom, L. M. ENGINEERING FOR PIPE LINE RIVER CROSSINGS 200
Oehler, H. A. and Van Winkle, M. COMPARISON OF TBP AND ENGLER TYPE DISTILLATIONS AT SUBATMOSPHERIC PRESSURES 70
Oettershagen, M. W. ONLY GAS CAN "HEAT ALL OUTDOORS" 18
Offut, E. B. and Sorg, L. V. ANALYZER-RECORDER FOR MEASURING HYDROGEN SULFIDE IN AIR 112
Ogle, M. R. DISSOCIATED AMMONIA (FURNACE ATMOSPHERE) 104
Ogorzaly, J. K. and Tyson, C. W. VOLATILE FUEL PRODUCTION AND APPARATUS THEREFOR 27
Olansen, N. A. SECONDARY RECOVERY OPERATIONS IN THE TIJERINA NO. 3 UNIT RESERVOIR 165
Old. A. F. AIR AND GAS TREATMENT SYSTEM 45
Olinger, S. T. NEW DEVELOPMENTS IN RAPID MELTING OF BRASS 5
Olley, R. DIRECT-FIRED HEATERS IN CHEMICAL ENGINEERING 187
Olsen, H. L. and Gayhart, E. L. INCIPIENT FLAME PROPAGATION IN A TURBULENT STREAM 159
Olsen, C. A., Manufacturing Co. See Downe, E. R.
Olson, R. W. HIGH RESOLUTION REFLECTION SEISMOGRAPH 67
O'Neal, C., Jr. EFFECT OF AMMONIA ADDITION ON LIMITS OF FLAME PROPAGATION FOR ISOOCTANE-AIR MIXTURES AT REDUCED PRESSURES AND ELEVATED TEMPERATURES 122
O'Neal, M. J., Jr. See Clerc, R. J.; Martin, J. M., Jr.
Opler, A. SAVE TIME, MONEY, WITH COMPUTERS 14
Oppenheim, A. K. RADIATION ANALYSIS BY THE NETWORK METHOD 98;—and Chilton, E. G. PULSATING-FLOW MEASUREMENT — A LITERATURE SURVEY 97
O'Quinn, P. C. See Brooks, T. P.
Ore, F. and Moulton, R. W. ADSORPTION OF

BINARY HYDROCARBON MIXTURES ON ACTIVATED CHARCOAL—MOLECULAR WEIGHT VARIATION 149
Organick, E. I. EQUILIBRIUM RATIO CHARTS FOR HYDROCARBON SYSTEMS 128;—FLASH CALCULATIONS AS PERFORMED ON THE IBM CARD PROGRAMMED CALCULATOR 168
Orlicek, A. F. and Sattler-Dornbacher, H. NOMOGRAMM ZUR BERECHNUNG DER DIFFUSIONSKONSTANTEN VON PARAFFIN-KOHLENWASSERSTOFFEN. (NOMOGRAM FOR THE CALCULATION OF DIFFUSION CONSTANTS OF THE PARAFFIN HYDROCARBONS) 133
Orlofsky, S. See Poindexter, L. C.
Ormsby, G. S. See Bobo, R. A.
Orning, A. A. and Sterling, E. OXYGEN TRANSFER BETWEEN CARBON DIOXIDE AND CARBON MONOXIDE IN THE PRESENCE OF CARBON 29
Osterloh, K. See Schenk, P.
Othmer, D. F. and Frohlich, G. J. CORRELATING PERMEABILITY CONSTANTS OF GASES THROUGH PLASTIC MEMBRANES 152
Ourusoff, L. A. G. A. AIR CONDITIONING RESEARCH PROGRAM 209
Overbeck, J. E. REPORT OF COMMITTEE ON GAS MEASUREMENT REPORT No. 3 9

P

Pacific Coast Gas Association DATA BOOK ON GAS UTILIZATION 38
Paez, J., Reed, P. and Calhoun, J. C., Jr. RELATIONSHIP BETWEEN OIL RECOVERY, INTERFACIAL TENSION, PRESSURE GRADIENT IN WATER WET POROUS MEDIA 145
Palmer, E. L. TOWARD A BETTER UNDERSTANDING 17
Palmer, G. H., and Alexander, C. HEAT TREATMENT OF SOLID CARBON-CONTAINING MATERIALS 192
Palmer, W. D. GIVE YOUR PIPE COATING A CHANCE 171
Palmer, W. J. EFFECT OF CHANGES IN GAS COMPOSITION ON COMBUSTION CHARACTERISTICS 41
Paredes, F. and Mize, W. W. GAS LINE HYDROGEN BLISTERS AND HOW TO PREVENT THEM 47
Parekh, R. H. ABSORPTION AND STRIPPING DESIGN. PART I. BASIS FOR DESIGN METHOD: PART II. EXAMPLE CALCULATION FOR ABSORPTION SYSTEM: PART III. EXAMPLE CALCULATION FOR STRIPPING SYSTEM 185
Parish, C. E. and Cornell, D. NEW DESIGN METHOD FOR VENT LINES 90
Parker, A. THE PRE-TREATMENT OF COAL BEFORE CARBONISATION 213; See Hinshelwood, C. N.
Parker, M. E. HOW ABOUT PLASTIC TAPE COATING? 26;—POLYETHYLENE TAPE FOR PIPE COATING 67;—ECONOMICS IS A BASIC PROBLEM 100;—FUNDAMENTALS OF CORROSION SURVEYS 136
Parmelee, G. V., Sullivan, G. E. and Cerny, A. N. WEATHER DATA ANALYSIS FOR COOLING SYSTEM DESIGN ILLUSTRATED BY DATA FOR NEW ORLEANS 139
Parrett, W. S. GAS HEATER CONTROL 174
Paschke, M. THE COMPLETE GASIFICATION OF GAS COAL IN SHAFT-FURNACES WITH INTERMEDIARY CONVERSION INTO FERROCOKE: ITS IMPORTANCE FOR THE GAS AND METALLURGICAL INDUSTRIES 214
Patrick, E. A. See Henshilwood, C. P.
Patterson, V. C. and Assoc. See Ruff, A. W.
Patton, H. W., Lewis, J. S., and Kaye, W. I. SEPARATION AND ANALYSIS OF GASES AND VOLATILE LIQUIDS BY GAS CHROMATOGRAPHY 92
Paulovich, M. See Donsky, A.
Paulsen, C. F. See Mindler, A.
Payne, J. Q. See Barusch, M. R.
Peabody, A. W. RECTIFIERS VS. GALVANIC ANODES AND OTHER DETAILS OF CATHODIC PROTECTION 227
Peachey, G. H., Jr. STOPPING A 24-IN. MAIN 196
Peacock, P. E., Jr. HOW TO REDUCE TREATING COSTS WHEN USING AMMONIA 5
Pearce, F. G., and Latta, J. E. METHOD FOR GASIFICATION OF SUBTERRANEAN CARBONACEOUS DEPOSITS 63
Pearce, T. J. PRODUCTION OF WATER GAS AND THE LIKE 196
Pearson, C. E. See Emmons, H. W.
Pechman, A. HIGH TEMPERATURE CERAMIC COATINGS 56
Peckham, J. W. PIPELINE TELEMETERING 181
Peel, G. N. THE CERAMIC APPLICATIONS OF ZIRCON AND ZIRCONIA 208
Peery, L. C., McKane, R. H., and Moses, D. V. PREPARATION OF SYNTHESIS GASES FROM CARBONACEOUS SOLIDS 44
Pemberton, J. E. RENTALS BUILD WATER HEATING LOAD 19
Penner, S. S. and Bjoernerud, E. K. EXPERIMENTAL DETERMINATION OF ROTATIONAL TEMPERATURES AND CONCENTRATIONS OF OH IN FLAMES FROM EMISSION SPECTRA 81
Penning, H. M. See Klinkert, H. G.
Pennington, N. A. HUMIDITY CHANGER FOR AIR-CONDITIONING 78
Pennington, W. HOW TO FIND ACCURATE VAPOR PRESSURES OF LiBr WATER SOLUTIONS 139
Pepkowitz, L. P. CONTINUOUS DETECTION AND MEASUREMENT OF LOW CONCENTRATIONS OF OXYGEN IN GASES 93
Perfection Stove Co. See Squire, H. A.
Perry, H. See Elliott, M. A.
Peters, E. D. and Jungnickel, J. L. IMPROVEMENTS IN KARL FISCHER METHOD FOR DETERMINATION OF WATER 112
Peters, W. C. A PRACTICAL METHOD OF UTILIZING GAS LOAD DATA IN DISTRIBUTION SYSTEM DESIGN 127;—LOAD DATA MECHANICS 180
Peterson, E. A. See Ballard, S. A.
Petrarca, C. A. See Zahnstecher, L. W.
Pettyjohn, E. S. METHOD OF DEVOLATIZING COAL FUEL 106;—and Linden, H. R. METHOD OF PREPARING FUEL GAS INTERCHANGEABLE WITH NATURAL GAS 125;—and Fredersdorff, von, C. G. METHOD FOR GASIFYING COAL 193; See Dirksen, H. A.; Linden, H. R.; Reid, J. M.
Pfeiffer, C. and Sandler, H. J. AMMONIA FROM CAT REFORMER OFF-GAS 143
Pfeil, L. B. METALLURGICAL ASPECTS OF DRY CORROSION 100
Phillips Petroleum Co. See Barton, H. M., Jr.; Bearer, L. C.; Bottenberg, K. X.; See Box, E. O.; Boyer, L. H.; Buell, C. K.; Carpenter, P. G.; Comes, M. R.; Farrow, H. L.; Gilmore, F. E.; Hartwick, E. F.; McCarthy, J. W.; Mayland, B. J.; Milam, P. B.; Miller, E. C.
Phinney, J. A. TREATMENT OF AGGLOMERATIVE CARBONACEOUS SOLIDS 141
Pichler, H. R. and Chervenak, M. C. PRODUCTION OF ACETYLENE 13
Pilcher, J. M., Walker, P. L., Jr. and Wright, C. C. KINETIC STUDY OF THE STEAM-CARBON REACTION. INFLUENCE OF TEMPERATURE, PARTIAL PRESSURE OF WATER VAPOR, AND NATURE OF CARBON ON GASIFICATION RATES 223
Pilling, A. H. and Boll, M. W. CONCRETE CON-

STRUCTION: HOW TO PLAN FORMS IN DETAIL 15; — CONCRETE MIXING AND PLACING: HOW TO PLAN FORMS IN DETAIL 35
Pinatelli, T. HEATER APPLICABLE TO FLOOR AND WALL 175
Pipelife, Inc. See Curtis, A. C.
Pipe Linings, Inc. See Matheny, F. M.
Pirou, G. See Renaudie, M.
Pittsburgh Consolidation Coal Co. See Gorin, E.; Phinney, J. A.
Pixler, R. SUCCESSFUL BOILER CONVERSION TO GAS-OIL FIRING 139
Podbielniak, W. J. and Preston, S. T. HYDROCARBON ANALYSIS MADE MORE ACCURATE, SPEEDY 149
Poettmann, F. H. and Bergman, W. E. DENSITY OF DRILLING MUDS REDUCED BY AIR INJECTION 197; See Nisle, R. G.
Poindexter, F. E. and Lowe, F. W. ROTATABLE CARBONIZING MACHINE 43
Poindexter, L. C., Proper, G., Orlofsky, S. and Clark, O. W. A SYMPOSIUM ON GAS PIPE LINE TESTING 200
Poirier, R. H. and Benington, F. THE CHEMISTRY OF HYDRAZYL FREE RADICALS. IV. CHROMATOGRAPHIC STUDIES WITH α, α-DIPHENYL-β-PICRYL HYDRAZYD AND SOME OF ITS DERIVATIVES 40
Polderman, L. D. EQUILIBRIUM DEW POINTS IN NATURAL GAS-GLYCOL SYSTEMS 196;—Dillon, C. P., and Steele, A. B. WHY M.E.A. SOLUTION BREAKS DOWN IN GAS-TREATING SERVICE 128
Pomatti, R. C., Meeker, R. F., and Levin, H. APPLYING SPECTROSCOPY IN PETROLEUM ANALYSIS 29; See Gent, L. L.
Poor, W. B. WHAT FACTORS AFFECT PIPE LINE DESIGN? 47
Pope, J. G. and Richardson, B. FIREDAMP REFORMING 26
Pople, J. A. See Buckingham, A. D.
Porter, F. W. CATALYTIC DESULFURIZATION OF PETROLEUM HYDROCARBONS 69; 166
Porter, L. E. COMPONENT CHECKING BURNER CONTROL APPARATUS FOR STANDING PILOT SYSTEMS 3
Porter, P. and Wyld, G. ELIMINATION OF INTERFERENCES IN FLAME PHOTOMETRY 150
Postlewaite, W. R., West, A. C., and Cavigli, H. J. ROTATING PISTON GIVES PRECISION TO NEW WELL DEPTH-PRESSURE RECORDER 99
Potter, J. H. See Miao, Y. M.
Potter, R. D. CALIBRATION OF A NICKEL-MOLYBDENUM THERMOCOUPLE 15
Pountney, C. H., Jr. ESSENTIAL CHARACTERISTICS AND PROPER INSTALLATION METHODS FOR PROTECTIVE DEVICES FOR DOMESTIC STORAGE-TYPE WATER HEATERS REGARDLESS OF THE ENTERGY USED FOR HEATING 19
Powell, S. T. and von Lossberg, L. G. OF WHAT USE ARE CHEMICAL TREATMENTS IN CONTROLLING CORROSION? 208
Power, H. H. See Milner, C. P.
Power Jets Research and Development Ltd. See Farnham, P. L.
Powers, R. W., Mattox, R. W. and Johnston, H. L. THERMAL CONDUCTIVITIES OF CONDENSED GASES. I. THE THERMAL CONDUCTIVITY OF LIQUID NITROGEN BETWEEN 65 AND 90° K. II. THE THERMAL CONDUCTIVITIES OF LIQUID NORMAL AND OF LIQUID PARAHYDROGEN FROM 15 TO 27° K. III. THE THERMAL CONDUCTIVITY OF LIQUID DEUTERIUM FROM 19 TO 26° K. 52
Prausnitz, J. M. ISENTROPIC COMPRESSION OF NONIDEAL GASES 162
Prescott, B. O. GRAPHICAL METHOD FOR CALCULATING DIP AND STRIKE FROM CONTINUOUS DIPMETERS 144
Preston, S. T. See Podbielniak, W. J.
Preway, Inc. See Jensen, K. S.
Price, D. THERMODYNAMIC FUNCTIONS OF CARBON DIOXIDE. ENTHALPY, ENTROPY, AND ISOBARIC HEAT CAPACITY AT 100° TO 1000° C. AND 50 TO 1400 BARS 204
Price, T. W. See Miao, Y. M.
Price, W. A. A NEW APPROACH TO MAPPING THE CONTINENTAL SHELF 107
Price, W. J. THE DETERMINATION OF TRACE ELEMENTS IN MAGNESIUM AND ITS ALLOYS BY SPECTROGRAPHIC PROCEDURES 167
Prien, C. H. PYROLYSIS OF COAL AND SHALE 212
Priestley, J. J. AN OUTLINE OF GAS PURIFICATION 25
Prigg, J. A. AERATED BURNERS 80; See Mills, F. E.
Prince, M. B. SILICON SOLAR ENERGY CONVERTERS 152
Pring, R. T. WET CYCLONE SCRUBBER 45
Pritchard, J. F. and Co. See Spangler, C. V.
Probst, R. E. HYDROGENATION OF CARBON MONOXIDE UTILIZING AN ALLOY CATALYST 68
Proper, G. See Poindexter, L. C.
Puckett, J. E. See Grimes, M. D.
Purlee, E. L. See Taft, R. W., Jr.
Pye, W. D. DISCOVERY PROSPECTS GOOD ON WILLISTON'S EAST FLANK 86
Pyle, C. See Jones, J. B.

Q

Queret, Y. and Guillet, R. CHEMICAL PURIFICATION OF GAS, AND SULFUR RECOVERY PROGRESS AND NEW APPLICATIONS 215
Quiram, E. R. DETERMINATION OF SULFUR IN VOLATILE HYDROCARBON MIXTURES BY A LAMP-CONDUCTOMETRIC METHOD 94

R

Raats, E. See Walker, P. L., Jr.
Radecke, F. T. COMBAT ATMOSPHERIC CORROSION 56
Radd, F. J. See De Witte, L.
Raftery, M. M. See Arthur, J. R.
Rahm, H. E. See Kelley, G. A.
Rahmes, M. H. See Kennedy, F. G.
Ranes, J. W. See Gee, R. E.
Rall, H. T. See Thompson, C. J.
Ralph, H. D. EPC IS NEW LEGAL WILL-O-THE-WISP 37
Ramsey, D. E. See Hurst, R. E.
Ramsey, R. P. THE FREE PISTON TURBINE PRIME MOVER 20
Rankin, A. W. See Curran, R. M.
Rappolt, H. G. METAL FINISH BAKING WITH GAS RADIANT AND CONVECTION 212
Rasmussen, G. MATERIAL HANDLING PLANTS FOR GAS WORKS 225
Rasor, J. SELECTING A HOLIDAY DETECTOR 116
Ray, W. A. COMBINED GAS AND OIL BURNER CONTROL SYSTEM 119; — FUEL CONTROL MEANS 119
Raymer, H. G. See Norman, E. A., Jr.
Rea, T. H. PREVENTING STEAM SHORT CIRCUITING 138
Records, E. H. APPARATUS FOR TREATING AND CALCINING CARBONACEOUS MATERIALS 21
Reed, P. HOW TOUGH CAN A PIPELINE JOB GET? 200; See Paez, J.
Reed, S. G., Jr. See Heybey, W. H.
Regents of the University of Minnesota See Davis, E. W.

Reichelderfer, C. A. See Norman, E. A., Jr.
Reichert, H. See Bennett, A. R.
Reid, J. M., Linden, H. R. and Pettyjohn, E. S. PRODUCTION OF PETROCHEMICALS FROM NATURAL GAS AND NATURAL GAS LIQUIDS 134; See Linden, H. R.
Reid, L. S. METHOD OF DEHYDRATING NATURAL GAS AND RECOVERY OF LIQUEFIABLE HYDROCARBONS THEREFROM AT HIGH PRESSURES 64
Reidel, J. C. PHILLIPS UNVEILS BIG POLYETHYLENE PLAN 153;—POLYETHYLENE: READY FOR A BOOM 154
Reilley, C. N. See Everett, G. W.
Reilly, J. STROAGE HITS NEW PEAK 199;—THEY'RE 2 MONTHS AHEAD WITH 36-INCH 200; See Casper, J. C.
Reiter, F. M. HOT WATER FOR LARGE VOLUME NEEDS 4; 60
Reiter, S. H. See Summerfield, M.
Reitzer, B. J. and Lamb, G. G. PREFLAME OXIDATION AND DETONATION OF CYCLOPENTANE AND 2,2,4-TRIMETHYLPENTANE 140
Reman, G. H. EFFECT OF GAS AND SOLID MIXING IN FLUIDIZED BEDS ON CHEMICAL REACTIONS 98
Renaudie, M. and Pirou, G. DEVELOPMENT OF APPARATUS FOR THE SELECTION UNDER LABORATORY CONDITIONS OF COALS FOR USE IN COMPLETE GASIFICATION PLANT 215
Research Corporation See Armstrong, J. A.; Davis, A. S., Jr.; Hedberg, C. W.; Wintermute, H. A.
Resen, F. L. SEVEN PLANTS IN ONE MAKE VERSATILE PETROCHEMICAL GIANT 13;—RENWAR'S NEW ISLAND PROCESSING PLANT 64;—STREAMLINE PLANT MAINTENANCE 65;—HERE'S HOW TRANSCO INTERNALLY COATS 187;—WHEN REFORMER PIPING FAILED TROUBLE SLEUTHS FOUND OUT WHY AND ACTED 228
Reudelhuber, F. O. BETTER SEPARATOR SAMPLING OF CRUDE-OIL RESERVOIRS 26
Reynolds, D. A. See Smith, F. W.
Reynolds, P. E. P. G. & E.'S SUPER INCH 109
Rhea, T. R. QUICK SOLUTIONS TO GAS FLOW PROBLEMS 34;—GAS TURBINES VS RECIPROCALS FOR PIPELINE COMPRESSORS 85
Rheem, Mfg. See Zylstra, J. J.
Rheinpreussen AG. See Koelbel, H.
Rhodes, R. I. See Mueller, F. H.
Rhys Jones, D. C. See Chapman, W. R.
Rice, J. L. See Berl, W. G.
Richards, J. C. GRANULAR FLOW THROUGH BUNKERS 177
Richardson, B. See Pope, J. G.
Riesenfeld, F. C. See Blohm, C. L.
Reisz, C. H. and Lurie, P. C. METHOD OF PREPARING A GAS INTERCHANGEABLE WITH COKE OVEN GAS CARBURETED GAS, OR MIXTURES THEREOF 44
Riesz, P. A. See Taft, R. W., Jr.
Rieve, R. W. REMOVAL OF CARBONYL SULFIDE FROM HYDROCARBON GASES 194
Riggin, D. M. and Kendrick, C. L. ANALYZE RESERVOIR FLUIDS FOR ACID GAS AND FOR HYDROCARBONS AT SAME TIME 221
Ringelstein, H. HIDDEN COSTS ELIMINATED IN MASS RECORD-KEEPING SYSTEM 45
Ringer, F. W. SOLUTION OF CATHODIC PROTECTION INTERFERENCE PROBLEMS 115
Riordan, M. A. HERE IS WHY PIPE LINES CORRODE 116
Rippie, C. W. See Sandona, O. J.
Rivas, M. A., Jr. and Shapiro, A. H. ON THE THEORY OF DISCHARGE COEFFICIENTS FOR ROUNDED-ENTRANCE FLOW METERS AND VENTURIS 76
Roach, K. MEASUREMENT TECHNIQUE FOR HIGH VACUUM 35
Robb, J. C. See Callear, A. B.
Roberts, A. L., Jr. PROBLEMS INVOLVED IN THE RELOCATION OF UTILITY FACILITIES UNDER THE NATIONAL HIGHWAY PROGRAM 219
Roberts, L. M. See Hedgerg, C. W.
Robertshaw-Fulton Controls Co. See Caparone, M. J.; Strobel, C. K.
Robertson, A. J. MASS SPECTRAL SEARCH FOR H_2O_2 IN A GASEOUS MIXTURE CONTAINING HO_2 AND O_2 30
Robertson, N. H. GASIFICATION PLANT DEVELOPMENTS 22
Robertson, R. See Rumford, F.
Robinson, J. A. See Akers, W. W.
Robinson, J. F. WHY THE HARRIS BILL SHOULD BE AMENDED 157
Rochette, R. E. GAS DELIVERY REGULATOR 119
Rochow, W. F. and Burke, W. C. REFRACTORY DESIGN INCREASES KILN EFFICIENCY 105
Rodabaugh, E. C. See Markl, A. R.
Rodgers, J. K. See Walters, R. J.
Rodgers, D., Jr. SUB-DEVONIAN EXPLORATION IN THE NORTHERN APPALACHIAN BASIN 107
Rollins, J. T. See Hurst, R. E.
Romero, M. F. FIRST CATALYTIC PLANT REFORMING NATURAL GAS IN ARGENTINA 26
Roper Corp. See Hollman, P. I.; Koebbeman, R. F.
Rose, A. and Biles, W. R. RELATIVE VOLATILITY OF BINARY MIXTURES FROM A FRACTIONATING COLUMN AT FINITE REFLUX 114
Rose, H. J. See Igo, J. W.
Rosen, P. See Berl, W. G.
Ross, W. L. and McLaughlin, E. R. AN ANALYSIS METHOD FOR PREDICTING BEHAVIOR OF SOLID ADSORBENTS IN SOLID SORPTION DEHUMIDIFIERS 119
Rosu, G. G. THE TURBINE DRILLING SYSTEM AND ITS APPLICATION IN THE U. S. S. R. 114
Rothfus, R. R., Monrad, C. C., Sikchi, K. G. and Heidger, W. J. ISOTHERMAL SKIN FRICTION IN FLOW THROUGH ANNULAR SECTIONS 170
Rothman, A. J. and Bromley, L. A. HIGH TEMPERATURE THERMAL CONDUCTIVITY OF GASES 151
Rotzler, P. M. See Yellott, J. I.
Rowe, V. R. See Frumer, J.
Royer, M. B. See Buehl, R. G.
Royster. P. H. PROCESS FOR THE DESTRUCTIVE DISTILLATION OF CARBONACEOUS MATERIALS 111
Rubenstein, S. W. WHAT YOU NEED TO GET STORAGE RIGHTS 174
Ruby, C. L. See Edmister, W. C.
Rudolf, H. J. DESIGN AGAINST ATMOSPHERIC CORROSION 227
Ruff, A. W. HEAT PUMP WATER HEATER 58
Rufleth, W. See Dunbar, R. J.
Ruhl, C. L. GAS-FIRED HEATER AND RADIANT THEREFOR 3
Rumbel, R. C. A SUBSURFACE FLOW METER 155
Rumford, F. THE ASORPTION OF CARBON DIOXIDE BY ALKALINE SOLUTIONS 97
Rummel, R. CARBONIZATION AND GASIFICATION OF BITUMINOUS MATERIAL 141
Rusinko, F., Jr. See Walker, P. L., Jr.
Russell, J. H. INTERPRETATION PROBLEMS IN RADIOACTIVITY LOGGING 163
Rutenberg, E. A. COOKING RANGE 39
Rygard, S. O. HEAT TRANSFER BETWEEN TWO MEDIA ACCORDING TO THE CARNOT PRINCIPLE 58
Ryman, L. J. SOUTHWEST MULDOON BELIEVED NOW FULLY DEVELOPED 90

S

Sacha, L. A., Jr. See Squire, H. A.

Sachsse, H., Kosbahn, T., and Lehrer, E. PROCESS FOR THE PRODUCTION OF ACETYLENE BY INCOMPLETE COMBUSTION OF HYDROCARBONS 205

Sage, B. H. METHOD AND APPARATUS FOR PARTIAL COMBUSTION OF GASIFORM HYDROCARBONS 195; See Stewart, D. E.

Sage, J. F. WATER ANALYSES HELP IDENTIFY FORMATIONS 65

Sale, B. See Vichnievsky, R.

Sallee, W. L. and Gionta, A. TAILOR-MADE FRACTURING PAYS OFF IN THE ROCKIES 164

Salmon, R. MULTICOMPONENT FRACTIONATION 114

Saltzman, B. E. COLORIMETRIC MICRO-DETERMINATION OF NITROGEN DIOXIDE IN THE ATMOSPHERE 50

Samans, W. KEEP THOSE PRESSURE VESSELS SAFE 170;—PRESSURE RELIEF DEVICES 186

Sampson, E. N. JUST ONE SWITCH TO START AND LOAD MAINLINE COMPRESSORS 127

Sandler, H. J. See Pfeiffer, C.

Sandler, S. See King, R. O.

Sandona, O. J. and Rippie, C. W. ELECTRIC MERCAPTAN AND AMINE SALT-H_2S PROCESSES 27

Sansam, W. and Gigiel, J. RECENT DEVELOPMENTS IN BYPRODUCT RECOVERY PLANT 123

Sarjant, R. J. See Kirby, W. A.

Sassmanhausen, L. C. MIXING TUBE FOR GAS BURNERS 39

Sattler-Dornbacher, H. See Orlicek, A. F.

Saurwein, G. K. RENEWING UNDERGROUND PIPING 67

Scafe, L. R. BETTER REFRIGERANT PIPING FOR PARALLEL COMPRESSOR SYSTEMS 5

Scheel, L. F. DEVELOPMENT OF THE MODERN GAS ENGINE COMPRESSOR PLANT 45

Scheeline, H. W. FRACTIONATION OF HYDROCARBON GASES BY SOLID ADSORBENTS 52

Schenk, P. and Osterloh, K. VERSUCHE DER KATALYTISCH-THERMISCHEN SPALTUNG VON GASFOERMINGEN UND FLUESSIGEN KOHLENWASSERSTOFFEN. (RESEARCH ON THE CATALYTIC-THERMAL CRACKING OF GASEOUS AND LIQUID HYDROCARBONS) 106

Schilling, W. M. See Senatoroff, N. K.

Schilmoller, C. M. See Neumaier, B. W.

Schmid, C. and Woodruff, M. L. GROUP EXPERIMENTS TO TEST THE RELIABILITY OF POROSITY AND PERMEABILITY MEASUREMENTS IN CORE SAMPLES 146

Schneider, W. G. See Nicholson, G. A.; Whalley, E.

Schneiter, E. J. GAS HEATERS 175

Schomer, R. T. See Sheehan, T. V.

Schramm, L. B. PISTON VERSUS ROTARY AIR COMPRESSORS 127

Schrenk, H. H. INDUSTRIAL HYGIENE 11;—CONTROVERSIAL TOXICITY OF OXIDES OF NITROGEN CONTINUES TO RECEIVE ATTENTION—HYDROGEN PEROXIDE TOXICITY REPORTED 93;—TOXICITY STUDIES PARALLEL INDUSTRIAL INTEREST IN ISOCYANATES: OZONE AND OXIDES OF NITROGEN CONTINUE TO RECEIVE ATTENTION 183

Schuhmann, S. See Shepherd, M.

Schultz, H. See Grumer, J.

Schultz, W. E. MUD PRACTICES VARY GREATLY IN SOUTHEASTERN NEW MEXICO 197

Schuman, S. C. See Johnson, C. A.

Schutrum, L. F., Vouris, J. and Min, T. C. PRELIMINARY STUDIES OF HEAT REMOVAL BY A COOLED CEILING PANEL 79

Schuyer, J. and Van Krevelen, D. W. CHEMICAL STRUCTURE AND PROPERTIES OF COAL VI —CALORIFIC VALUE 6;—CHEMICAL STRUCTURE AND PROPERTIES OF COAL XI—THERMAL EXPANSION COEFFICIENT 178; — and Dijkstra, H. CHEMICAL STRUCTURE AND PROPERTIES OF COAL VII—ELASTIC CONSTANTS 21; see Groenewege, M. P.

Schwalm, L. AN AUTOMATIC CIRCUIT INTERRUPTER FOR USE IN CATHODIC PROTECTION SYSTEM DESIGN 207

Schwartz, H. A LOW COST ANALOG COMPUTER 98

Schwarz, G. L. EVAPORATIVE COOLING IN HUMID AREAS 118

Schwarz, N. See Croes, G. A.

Schwerdtfeger, W. J. and Denison, I. A. GEOMETRIC FACTORS IN ELECTRICAL MEASUREMENTS RELATING TO CORROSION AND ITS PREVENTION 136

Scogin, R. J. See Meyer, L. W.

Scott, C. UNDERGROUND STORAGE AND ITS RELATION TO GAS DISPATCHING 146

Scott, R. B. See Armstrong, G. T.

Sédille, M. H. COMBINED SUPER-CHARGED BLAST-FURNACE AND GAS TURBINE PLANT 81

See, W. G. SUBMERGED COMBUSTION EQUIPMENT 20

Seely, B. K. DETECTION OF CERTAIN IONS IN 10^{-16}-to-10^{-19}-GRAM PARTICLES 70

Segeler, C. G. and Kafka, E. M. COMPARATIVE TOTAL COSTS OF GAS AND ELECTRICITY FOR COOKING AND WATER HEATING IN RESIDENCES 157

Sehon, A. H. and Darwent, B. D. THE THERMAL DECOMPOSITION OF MERCAPTANS 14

Selas Corp. See Hess, F. O.; Krieble, E. L.

Senatoroff, N. K., and Schilling, W. M. CATHODIC PROTECTION ON THE BIGGEST INCH LINE 207

Serif, M. HERE'S HOW TO SELL HEATING KEY TO NEW LOAD GROWTH 119;—NO WHERE BUT UP FOR WATER HEATER BOOM 190

Servel, Inc. See Ashby, C. T.

Seymour, R. B. NEOPRENE: IS IT THE BEST ALL-AROUND ORGANIC COATING? 76;—PLASTIC PIPE FOR UNDERGROUND STRUCTURES 208

Shaffer, D. U. ROTARY DRILLING WITH GAS UTILIZES FORMATION PRESSURE 127

Shapiro, A. H. See Rivas, M. A.

Shapleigh, J. H. PRODUCTION OF DOMESTIC GAS 125

Sharpe, G. C. THE CYCLONE FURNACE 20

Sharpe, L. G. ECONOMIC CONSIDERATIONS IN PIPE LINE CORROSION CONTROL 172

Shaw, J. F. A GRAPHIC METHOD OF DETERMINING THE EXPLOSIBILITY CHARACTERISTICS OF MINE-FIRE ATMOSPHERES 210

Shebeko, B. C. BLOWDOWN CHART 88

Sheehan, T. V., Schomer, R. T., and Dwyer, O. E. HEAT TRANSFER RATES FOR CROSSFLOW OF WATER THROUGH A TUBE BANK AT REYNOLDS NUMBERS UP TO A MILLION: AVERAGE FILM COEFFICIENTS FOR INDIVIDUAL TUBES. PART I;—and Weisman, J. CIRCUMFERENTIAL VARIATION OF FILM COEFFICIENT FOR INDIVIDUAL TUBES. PART II 98

Sheffield, J. V. See Odasz, F. B.

Sheldon, H. See Dugger, G. L.

Shell Development Co. See Ballard, S. A.; Engel, W. F.; Johnson, A. J.

Shepard, A. P. and McWaters, R. J. METALIZING FOR CORROSION PREVENTION 116

Shepard, F. P. STRATIGRAPHIC RESEARCH THAT MAY PAY OFF 91

Shepherd, M., Schuhmann, S., and Kilday, M. V. DETERMINATION OF CARBON MONOXIDE IN AIR POLLUTION STUDIES 111

Shepherd, T. L. See Moen, W. B.
Shepp, A. and Kutchke, K. O. AN ACCURATE METHOD OF ANALYSIS FOR SMALL QUANTITIES OF ETHYLENE 49
Sherlock, R. H. and Lesher, E. J. DESIGN OF CHIMNEYS TO CONTROL DOWN-WASH OF GASES 80
Sherwood, P. W. PARTIAL OXIDATION OF ETHYLENE 13;—SYNTHETIC DETERGENTS FROM PETROLEUM SOURCES 153;—PETROCHEMICALS UNLIMITED FROM ETHANE, PROPANE, BUTANES: DERIVATIVE HYDROCARBONS 169;—OIL REFINERIES AND CORROSION BY WATER 188
Sherwood, R. M. and Chapman, F. W., Jr. NEW TECHNIQUES FOR ANALYZING MIXTURES OF TRACE METALS 71
Shipko, F. J. See Dorfman, L. M.
Shivers, A. THE CHOICE: NATIONALIZATION OR PRIVATE ENTERPRISE 77
Shomaker, W. L. NATURAL GAS IS STILL THE BEST BUY 209
Shore, L. See Wohl, K.
Shreir, L. L. CORROSION INHIBITORS: INHIBITORS IN PRACTICE 16
Shu, N. W. and Bardwell, J. TEMPERATURE COEFFICIENTS IN HYDROCARBON OXIDATION 211
Shurkus, A. A. See Gillette, J. M.
Sibbitt, W. L. See Wellman, E. M.
Sickafoose, R. D. SPEEDS DISTRIBUTION NETWORK ANALYSIS 64;—A PUNCHED CARD PROGRAM FOR CALCULATING GAS DISTRIBUTION NETWORK PRESSURES BY THE HARDY CROSS METHOD 129
Sieg, R. P. and Wellman, H. B. CATALYTIC CONVERSIONS OF HYDROCARBONS 152
Sifrin, A. HORIZONTAL CYCLONE FURNACE 210
Sikschi, K. G. See Rothfus, R. R.
Silver, L. A COOLING AND CONDENSING SYSTEM ON A LARGE CARBURETTED WATER GAS PLANT 33;—CARBURETTED WATER GAS COOLING AND CONDENSING 43
Simmons, J. R. THE VIREY-ELLENBURGER TREND 166
Silverman, L. SAMPLING AND ANALYZING AIR FOR CONTAMINANTS 202; See Johnson, G. A.
Simmons, R. F. and Wolfhard, H. G. THE INFLUENCE OF METHYL BROMIDE ON FLAMES. PART I—PRE-MIXED FLAMES 211
Simon-Carves Ltd. See Bostock, W.
Simon, D. M. See Dugger, G. L.
Simpson, R. M. APPARATUS AND TECHNIQUE 28
Sinclair Refining Co. See Keith, C. D.
Sinclair, W. D. HOW MUCH DOES A HEAT PUMP SYSTEM COST? 159
Sing, K. S. See Harris, M. R.
Sittig, M. ACETYLENE—A CHALLENGE TO THE PETROCHEMICAL INDUSTRY 184
Sivalls Tanks, Inc. See Lovelady, I. W.
Skelland, A. H. See Garner, F. H.
Slobod, R. L. See Caudie, B. H.
Smalley, G. E. and Klohr, J. W. REFINERY SULFUR RECOVERY AIDS AIR POLLUTION CONTROL 135
Smidth, F. L. and Co. See Borch, N. S.
Smith, A. Q. NESCO IMPROVES GALVANIZING BY SHIFT TO GAS 61;—HOW CERAMICS ARE FIRED FOR GAS HEAT 121;—TWO NEW ALUMINUM COATINGS IN USE 156;—LIGHTWEIGHT AGGREGATE MAJOR AID TO BUILDERS 191
Smith, B. QUANTITATIVE ANALYSIS OF MIXTURES OF HYDROGEN SULFIDE AND SULFUR DIOXIDE 92
Smith, C. D. See Black, J. F.
Smith, D. K. HOW ROCHESTER BUILDS LOAD WITH GAS HEAT 18
Smith, D. T. GEOPHYSICAL METHODS OF OIL PROSPECTING—A REVIEW. IV. SEISMIC METHODS 181
Smith, E. H. DRIER 3
Smith, F. C., Jr. METER OF THE FUTURE IS HERE 226
Smith, F. W. See Brantly, M. M.
Smith, F. W. and Reynolds, D. A. THE EFFECT OF TEMPERATURE, CHARGE DENSITY, AND BLENDING ON THE CARBONIZATION OF COAL 82
Smith, H. M. See Thompson, C. J.
Smith, J. R. See Dinneen, G. U.
Smith, J. W. RELAY CONTROL APPARATUS FOR BURNERS AND THE LIKE 174
Smith, L. PROFESSIONAL QUALIFICATIONS OF FEDERAL REGULATORY COMMISSIONERS. PART I 17;—PART II 38;—SHOULD PUBLIC UTILITY COMMISSIONERS BE ELECTED OR APPOINTED? PART I 117;—PART II 157
Smith, L. B., Mason, R. B., Blanding, F. H. and Hemminger, C. E. DISTILLATION OF OILBEARING MINERALS IN TWO STAGES IN THE PRESENCE OF HYDROGEN 48
Smith, R. R. See Canjar, L. N.
Smith, R. V., Williams, R. H. and Dewees, E. J. MEASUREMENT OF RESISTANCE TO FLOW OF FLUIDS IN NATURAL GAS WELLS 68
Smith, W. M. See Lehane, T. J.
Smith, W. M. SHALE OIL REFINING PROCESS 10
Smoot, T. H. SINGLE PORT GAS BURNER CONSTRUCTION 119
Snell, C. T. and Snell, F. D. SYNDET MANUFACTURE FROM PETROCHEMICALS 73
Snyder, R. E., and Clark, R. O. DETERMINATION OF TRACE AMOUNTS OF CARBONYL SULFIDE IN GASEOUS HYDROCARBONS 203
Snyder, R. I. PRACTICES USED BY DISTRIBUTION AND TRANSMISSION COMPANIES FOR GAS LEAKAGE DETECTION 217
Societe Rateau, S. A. See Sedille, M. H.
Socony-Vacuum Oil Co., Inc. See Wilson, R. C., Jr.
Solomon, E. See Hawley, E. R.
Sonn, H. W. METHODS ANALYSIS: KEY TO GREATER EFFICIENCY 104
Sorensen, J. H. See Hussey, A. S.
Sorg, L. V. See Offutt, E. B.
Soulé, J. L. THE PROCESS OF FISSURING IN COKE 83
Southern Lightweight Aggregate Corp. See Old, A. F.
Southworth, G. B. CONCRETE MIXING AND PLACING 11;—DESIGN AND CONTROL OF CONCRETE MIXES 76; 100
Spangler, C. V. METHOD OF AND APPARATUS FOR STORING GASES 179
Sparks, H. A. TRIGGER OPERATED GAS IGNITER 119
Spaulding, G. H. See Adams, C. I.
Spengler, W. E. See Milbourne, C. G.
Spice, J. E., Stavely, L. A. and Harrow, G. A. THE HEAT CAPACITY OF NICKEL CARBONYL AND THE THERMODYNAMICS OF ITS FORMATION FROM NICKEL AND CARBON MONOXIDE 95
Spink, C. THESE GAS DRYERS SELL THEMSELVES 39;—KILOWATT KOOKERY KAN'T KOMPARE 102
Spponer, C. E. See Belcher, R.
Springborn, H. W. WILL NATURAL GAS ACT BE PASSED? 157;—HARRIS-FULBRIGHT BILL UP NEXT YEAR 189
Springfield Burner Corp. See Edwards, M. R.
Spurlock, B. H., Jr. See Agnon, S. E.
Squire, H. A. and Sacha, L. A., Jr. GAS BURNER 174
Staffel, E. J. See Chu, J. C.
Stafford, P. M. RATIONAL THICKNESS DESIGN FOR PRESSURE VESSELS 74
Stahmer, A. M. GERMANY'S GOAL: 25 MILLION

BARRELS OF OIL IN 1959 182
Standard Oil Co. See Clarke, A. B.; Tom, T. B.
Standard Oil Development Co. See Black, J. F.; Burnside, H. E.; Gilbert, G. R.; Herbst, W. A.; Nagel, R. H.; Ogorzaly, J. K.; Probst, R. E.; Scheeline, H. W.; Smith, L. B.; Smith, W. M.; Sweetser, S. B.
Stanier, H. and McKean, J. B. THE PRODUCTION OF TOWN GAS BY THE CATALYTIC GASIFICATION OF PETROLEUM OIL. II. DEVELOPMENT AND OPERATION OF A COMMERCIAL PLANT 44
Stanolind Oil and Gas Co. See Kratzer, M. B.; Pearce, F. G.
Stark, V. PROCESS OF TREATING OIL GAS TO PRODUCE UTILITY GAS OF LOW HEAT CONTENT AND LOW GRAVITY WITH VALUABLE BY-PRODUCTS 215
Stauff, E. DEVICE FOR DEFLECTING A HIGH-SPEED JET OF GAS EJECTED THROUGH A NOZZLE 2
Staveley, L. A. See Spice, J. E.
Stead, F. L. DRICKEY-CAPROCK QUEEN SAND TREND 183
Steele, A. B. See Polderman, L. D.
Steen-Johnson, H. CONTROLLING SPEED IN PROCESS CONTROLS—DESIGNING AND APPLYING HIGH-SPEED TURBINES 115
Steinwedell, W. E. See Stookey, K. W.
Sterling, E. See Orning, A. A.
Stern, R. K. AUTOMATIC INTELLIGENCE GATHERING SYSTEMS 186
Sterrett, E. GULF INTERSTATE GAS LINE HAS MANY NOVEL FEATURES 146
Stevens, R. F. and Brady, J. F. APPLICATION OF PUNCHED CARDS TO CHEMICAL PROCESS CONTROL 10
Stewart, D. See Decker, W. H.
Stewart, D. E., Sage, B. H. and Lacey, W. N. VOLUMETRIC BEHAVIOR OF n-HEXANE IN LIQUID PHASE 96
Stewart, F. M., Garthwaite, D. L., and Krebill, F. K. PRESSURE MAINTENANCE BY INERT GAS INJECTION IN THE HIGH RELIEF ELK BASIN FIELD 148
Sticha, E. A. MODERN PIPE MATERIALS—KEY TO TODAY'S BETTER STEAM STATIONS 188
Stone, R. L. See Hampel, T. E.
Stookey, K. W., Steinwedell, W. E. and Kyle, R. T. METHOD AND APPARATUS FOR MAKING OIL GAS 194
Storch, H. H. THE MELCHETT LECTURE FOR 1954: PROBLEMS IN THE CHEMISTRY AND CHEMICAL UTILIZATION OF COAL 124
Stormont, D. H. HOW TO GET MAXIMUM RECOVERY FROM A DRY-GAS FIELD 201
Straatemeier, J. R. See Lynn, S.
Strasser, D. M. FROM HYDROCARBONS TO CARBON BLACK 45
Straus, S. See Madorsky, S. L.
Strobel, C. K. AUTOMATIC PILOT AND IGNITION SYSTEMS FOR FUEL BURNER 119;—IGNITION AND AUTOMATIC PILOT CONTROLS FOR FUEL BURNERS 120
Strom, R. See King, R. O.
Strong, H. M. and Bundy, F. P. MEASUREMENT OF TEMPERATURES IN FLAMES OF COMPLEX STRUCTURE BY RESONANCE LINE RADIATION. I. GENERAL THEORY AND APPLICATION TO SODIUM LINE REVERSAL METHODS 40; See Bundy, F. P.
Strong, J. D. A PRACTICAL APPROACH TO ANALOG COMPUTERS 184
Strong, R. G. THE CASE FOR 37½° BEVEL IN PIPELINE WELDING 218
Stumm, J. B. THE SONIC OILWELL PUMP 111
Sturges, P. M. SMART REFRIGERATION HOOKUP SLASHES PLANT WATER-HEATING COSTS 211
Suhr, F. W. See Jensen, K. S.
Sukkar, Y. K. and Cornell, D. DIRECT CALCULATION OF BOTTOM-HOLE PRESSURES IN NATURAL GAS WELLS 147
Sullivan, G. E. See Parmelee, G. V.
Sulzer, P. T. THE INFLUENCE OF SOME CHEMICAL AND PHYSICAL FACTORS ON THE FORMATION OF DEPOSITS FROM RESIDUAL FUELS 42
Summerfield, M., Reiter, S. H., Kevely, V. and Mascolo, R. W. THE STRUCTURE AND PROPAGATION MECHANISM OF TURBULENT FLAMES IN HIGH SPEED FLOW 192
Summers, C. R., Jr. See McAfee, J.
Sun Oil Co. See Harper, J. I.; Hartung, C. A.
Sundaram, R. See Ghai, M. L.
Surface Combustion Corp. See Beggs, D.; Kelley, G. A.; Milborne, C. G.
Svenska Maskinverken A/B See Dalin, D.
Swaminathan, V. S. ENGLAND'S PETRO-CHEMICAL GIANT 153
Swearingen, J. S. and Levin, H. HYDROCARBON LOSSES FROM THE PETROLEUM INDUSTRY IN LOS ANGELES COUNTY 175
Sweetser, S. B. PRODUCTION OF GAS OF HIGH CALORIFIC VALUE 23; See Welty, A. B., Jr.
Sweitzer, C. W. METHOD OF TREATING FURNACE CARBON BLACK 179;—and Melore, P. J. METHOD OF TREATING FURNACE CARBON BLACK. PROCESS FOR ACTIVATING FURNACE BLACKS 179
Swerdloff, W., and Duggan, M. CUT CORROSION IN DEHYDRATION UNIT 171; See Baker, O.
Swingfire Ltd. See Huber, L.
Symonds, G. H. HOW TO USE LINEAR PROGRAMMING 158

T

Taft, R. W., Jr., Purlee, E. L. and Riesz, P. A METHOD FOR DETERMINING THE DISTRIBUTION CONSTANT FOR A SUBSTANCE BETWEEN THE GAS PHASE AND A CONDENSED PHASE 94
Talbot, J. E. CLEANABLE CORE BARREL 180
Tannhauser, J. U. OIL SUPPLY AND DEMAND IN EUROPE 69
Tappan Stove Co. See Hoff, J. M.
Tarmy, B. L. See Bonilla, C. F.
Taylor, A. H. See Hall, C. C.
Taylor, D. M. GULF INTERSTATE'S NEW STREAMLINED SYSTEM 8;—LAYING 36-INCH PIPE JUST LIKE 30-INCH 180
Taylor, F. C., Jr. See Lloyd, W. G.
Taylor, H. See Cimino, A.
Taylor, J. B. HOW WEATHER AFFECTS DESIGN OF A NATURAL-GASOLINE PLANT 164
Taylor, R. M. NEWLY DEVELOPED POROUS CHROMIUM PLATING INCREASES LIFE OF POWER CYLINDER LINER 196
Teichmann, C. F. and Grahame, J. H. HYDROCARBON SYNTHESIS WITH CATALYST OF LESS THAN ONE MICRON 202
Tenney, W. L. and Marks, C. B. RESONANT INTERMITTENT COMBUSTION HEATER AND SYSTEM 192
Teter, J. W. See Hettinger, W. P., Jr.
Texaco Development Corp. See Sage, B. H.; See Teichmann, C. F.
Texter, H. G. WHY OIL-WELL TUBING AND CASING FAIL IN TENSION, AND WHY THEY COLLAPSE. PART I 172;—WHY THEY BURST, LEAK, CRUSH, AND WHY LAST ENGAGED THREAD FAILS. PART II 228
Thayer, V. R. See Moses, D. V.
Thijssen, H. A. THERMODYNAMIC EVALUATION OF BINARY VAPOR-LIQUID EQUILIBRIA 168
Thoenes, H. W. DIE KOHLENDIOXYD-ABSORPTION SPERRFLUESSIGKEITEN ALS FEHLER-

QUELLE BEI DER GASANALYSE. (CARBON DIOXIDE ABSORPTION BY THE SEALING LIQUID AS A SOURCE OF ERROR IN GAS ANALYSIS) 70
Thomas, B. W. GAS CHROMATOGRAPHY MAY DEVELOP INTO USEFUL PROCESS ANALYZER 167
Thomas, M. K. A METHOD FOR DETERMINING WINTER DESIGN TEMPERATURES 138
Thomas, R. B. See Hamann, S. D.
Thomas, W. C. See Barker, J. E.
Thompson, C. J., Coleman, H. J., Rall, H. T. and Smith, H. M. SEPARATION OF SULFUR COMPOUNDS FROM PETROLEUM 94
Thomson, I. See Rumford, F.
Thornton, D. P., Jr. ARE PROCESS ANALYZERS FOR YOU? 115;—WHY CARTER LIKES ITS COKER 182
Thornton, J. D. LIMITING HOLDUP AND FLOODING RATES IN SPRAY-EXTRACTION COLUMNS 55
Thorvaldson, W. M. FRACTURING IN CANADA 108
Thrasher, L. W. and Binder, R. C. EFFECT OF EDGE THICKNESS ON SMALL ORIFICE METERS 55
Threlkeld, J. L. and Lordan, R. C. SOLAR RADIATION DURING CLOUDLESS DAYS 79
Thring, M. W. IMPROVING FURNACE PERFORMANCE BY MODEL INVESTIGATION 139
Tillman, J. M. NEW PLUGGING DEVICE PERMITS ISOLATION OF LINE 25
Tinker, E. E. See Mueller, F. H.
Tippy, W. B. WHAT WILL HAPPEN TO THE PRICE OF GAS 57
Tirrell, R. W. and Evers, J. P. DESIGN OF GAS METER STATION FLOW MEASURING FACILITIES 128
Tixier, M. M. See Kunz, K. S.
toe-Laer, C. M. See Laube, H. L.
Tom, T. B. and Bolt, J. A. MERCAPTAN EXTRACTION PROCESS 27
Tomlinson, N. P. See Hovious, R. L.
Tomlinson, R. C. EXPERIMENTS TO DETERMINE THE ERRORS OCCURRING IN THE PREPARATION OF COAL SAMPLES FOR LABORATORY ANALYSIS 6
Tomsic, W. J. DETERMINATION OF TRUE VAPOR PRESSURES 71
Tonn, W. H., Jr. TODAY'S PROCESSES ARE COMPARED 32
Totzek, F. METHOD AND APPARATUS FOR PREHEATING GASEOUS AND VAPOROUS REAGENTS IN POWDERED FUEL GASIFICATION 83; — GASIFICATION OF POWDERED FUEL AND USE OF A PROTECTIVE GAS 84;—PROCESS FOR PRODUCING FINELY DIVIDED COKE FROM BITUMINOUS FUELS 142
Townend, D. T. THE MELCHETT LECTURE FOR 1952, "HIGHWAYS AND BY-WAYS IN COMBUSTION" 19
Tracht, J. H. See Walters, R. J.
Tracy, G. W. See Gladfelter, R. E.
Traina, G. DISIDRATAZIONE DEL METANO SU ADSORBENTI. (METHANE DEHYDRATION UPON ADSORBENTS) 24
Tribit, S. W. See Fugate, W. O.
Troesch, H. A. THE ATOMIZATION OF LIQUIDS 206
Tucker, P. W. See Benz, G. R.
Turner, C. C. GAS IS THE SAFEST FUEL 137
Turner, N. C. GAS AND LIQUID CONTACT APPARATUS 33
Turner, R. W. See Mott, R. A.
Twomey, L. S. MANIPULATION OF NITROGEN-CONTAMINATED NATURAL GASES 66
Tyrell, D. WESTCOAST TRANSMISSION PLANS DELIVERIES TO U. S. IN 1956 157
Tyson, C. W. See Ogorzaly, J. K.

U

Uhl, W. C. WHY A COMPUTER FOR REFINING? 98
Uhlen, A. E. and Hayes, C. T. AIR POLLUTION K.O.'D 211
Ulrich, F. BETRACHTUNGEN UEBER UNTERSUCHUNGS-METHODEN ZUR KENNTNIS DES VERKOKUNGSVERMOEGENS VON KOHLEN. (INSPECTION OF RESEARCH METHODS FOR INFORMATION ON THE COKING POWER OF COALS) 214
United Engineers and Constructors, Inc. See Haug, J. S.
United States of America See Elliott, M. A.; Goff, J. C.
U. S. Bur. Mines SYNTHETIC LIQUID FUELS: ANNUAL REPORT OF THE SECRETARY OF THE INTERIOR FOR 1954: PART I. OIL FROM COAL: PART II. OIL FROM OIL SHALE 131
U. S. Thermo Control Co. See Jones, F. M.
Union Oil Co. of California See Bills, J. L.; McKinnis, A. C.
Universal Oil Products Co. See Leffer, F. A.
University Illinois HANDBOOK OF KITCHEN DESIGN 103
Updegraff, N. C. HOW TO SELECT EQUIPMENT TO PREVENT SOLUTION CARRY-OVER, REMOVE ACCUMULATED SLUDGE, PROVIDE FOR REGENERATION 217
Upson, F. A. FIELD WELDING HEAVY-WALL VESSELS 16
Uren, L. C. PROGRESS IN WELL-LOGGING TECHNIQUES 146

V

Vandaveer, F. E. GAS INCINERATOR CHARACTERISTICS: ACCEPTANCE, SERVICING AND LOAD 3
Van Deemter, J. J. HEAT AND MASS TRANSPORT IN A FIXED CATALYST BED DURING REGENERATION 74
Van den Berg, G. J. THE APPLICATION OF TURBOGRID TRAYS IN THE PETROLEUM INDUSTRY 135
Vander Heyden, H. C. and Wallace, E. A. HOLD THAT PIPELINE 180; See Wallace, E. A.
Van Dyke, B. H. and Dougherty, W. J. COST OF LOW TEMPERATURE PROCESSING 170
Van Kampen, G. R. HOW DO COSTS COMPARE FOR DRYING? 4
Van Krevelen, D. W. PROCESS FOR THE ELIMINATION OF OXYGEN FROM GASES 34;—THE PROBLEM OF COAL CONSTITUTION—THE THIRD COAL SCIENCE LECTURE 83;—and Chermin, H. A. CHEMICAL STRUCTURE AND PROPERTIES OF COAL. V—AROMATICITY AND VOLATILE MATTER 6; See Groenewege, M. P.; Schuyer, J.; Zwietering, P.
Van Loon, W. CYCLONE FURNACE 121
Van Meter, R. A. See Dinneen, G. U.
Van Ness, H. C. and Dodge, B. F. EFFECTS OF HYDROGEN AT HIGH PRESSURES ON THE MECHANICAL PROPERTIES OF METALS. I. APPARATUS, PROCEDURES, AND PRELIMINARY RESULTS 172
Van Swaay, M. See Juenker, D. W.
Van Waes, J. P. M. THE CHEMICAL INDUSTRY OF STAATSMIJNEN IN THE NETHERLANDS 141
Van Winkle, M. See Oehler, H. A.
Vapor Heating Corp. See Lehane, T. J.
Vaughan, A. L. NATURAL GAS CONDITIONING PROCESSES FOR HIGH PRESSURE TRANSMISSION 8
Vaughey, W. M. THE WHITE HOUSE REPORT ON ENERGY SUPPLIES AND RESOURCES POLICY 173
Venter, M. J. and Ledent, M. P. LA GAZEIFICATION

INTEGRALE DU POUSSIER DE CHARBON: PERSPECTIVES D'AVENIR. (COMPLETE GASIFICATION OF COAL DUST: FUTURE PROSPECTS.) 193
Vichnievsky, R., Sale, B. and Marcadet, J. COMBUSTION TEMPERATURES AND GAS COMPOSITION 104
Vickers, H. H. CONSTRICTION VALVE FOR FLUIDIZED SOLIDS 226
Bissey, L. T. and Villarreal, J. F. NATURAL GAS PIPELINE DEPOSITS 89
Vinson, N. L. DESIGN CORRECTIONS FOR ALTITUDE 102
Vivian, C. H. SWAPPING WATER FOR OIL 182
Voelker, J. G. PROCESS FOR PRODUCING A NATURAL GAS SUBSTITUTE FROM GAS OIL;—PROCESS FOR PRODUCING A NATURAL GAS SUBSTITUTE FROM HYDROCARBON OIL 62;—HOW TO LICK A LINE BREAK 142
Volianitis, E. See Canjar, L. N.
Volk, W. PRECISION OF MASS SPECTROMETER ANALYSES OF CARBURETED WATER GAS 11
Von Fredersdorff, C. G. REACTIONS OF CARBON WITH CARBON DIOXIDE AND WITH STEAM 176; See Pettyjohn, E. S.
von Massow, H. J. and von Holt, H. DEVELOPMENTS AND FEATURES OF HIGHER COKE-OVEN CHAMBERS 161
Vouris, J. See Schutrum, L. F.

W

Wade, O. W. START CORROSION PROTECTION BEFORE THE PIPE LINE IS LAID 116
Wadleigh, F. R. MAINTENANCE OF CHECK POINTS IN A MANUFACTURED GAS PLANT 156
Wagner, E. R. HOW TO MAINTAIN COMPRESSORS 8
Wagner, P. BURNING VELOCITIES OF ISOPROPENYL AND DIISOPROPENYL ACETYLENE 140;—and Dugger, G. L. FLAME PROPAGATION, V. STRUCTURAL INFLUENCES ON BURNING VELOCITY. COMPARISON OF MEASURED AND CALCULATED BURNING VELOCITY 60
Wainright, R. M. FOR CATHODIC PROTECTION POWER—RECTIFIER OR SACRIFICIAL ANODES 116
Waite, W. G. CATHODIC PROTECTION OF UNDERGROUND STRUCTURES 100
Walker, H. C. TRANSPORTATION OF BOG ORE 143
Walker, J. W. See Loyles, R. O.
Walker, P. L., Jr., and Rusinko, F., Jr. GASIFICATION OF CARBON RODS WITH CARBON DIOXIDE 105;—and Raats, E. CHANGES OF MACROPORE DISTRIBUTIONS IN CARBON RODS UPON GASIFICATION WITH CARBON DIOXIDE 105; See Pilcher, J. M.
Walker, R. L. WHAT'S AHEAD IN RIG DESIGN? 162
Walker, T. P. BUYING GAS FOR PIPE LINES 46
Wallace, B. P. COATED NON-IRRITATING COAL TAR PITCH 188
Wallace, E. A. and Vander Heyden, H. C. HOW TO SOLVE EXPANSION PROBLEMS IN HIGH PRESSURE LINES 180
Walter, F. PROCESS FOR REMOVING AN ALKALINE-EARTH METAL COMPOUND DUST 14
Walters, R. J., Tracht, J. H., Weinberger, E. B. and Rodgers, J. K. ETHYLENE COMPRESSIBILITY FACTORS 30
Walters, W. J. OIL GASIFICATION 142
Walz, R. F. DIGITAL COMPUTERS, GENERAL-PURPOSE AND DDA 226
Warner, C. W. See Gilbert, T. M.
Warner, E. L. See Hoff, J. M.
Washall, T. A. See Melpolder, F. W.
Waterfill, R. W. AIR CONDITIONING OF MULTI-ROOM BUILDINGS 19
Waterman, H. J. DIE BEDEUTUNG DER GRAPHISCH-STATISTISCHEN ANALYSE FUER DIE ERFORSCHUNG DER MINERALOELE. (THE SIGNIFICANCE OF GRAPHICAL-STATISTICAL ANALYSIS IN MINERAL OILS RESEARCH) 220
Watts, J. C. COATING PIPELINES IN PLACE INTERNALLY WITH PLASTICS 171
Weast, R. C. See Dugger, G. L.
Weatherford, W. D., Jr. See Karr, C., Jr.
Weaver, J. B. MORE HELP IN FINDING COST DATA 185
Webb, A. N. and Eschens, R. P. OXYGEN EXCHANGE IN CHEMISORBED CARBON MONOXIDE 222
Webber, H. M. See Hotchkiss, A. G.
Weber, G. RIVALRY BRIGHTENS RUBBER FUTURE 134;—WITH MORE COKERS COMING REFINERS WILL HAVE COKE TO BURN 201
Weber, J. H. ISOTHERMAL ENTHALPY CHANGES 72; See Hobson, M.; Hoffman, D. S.
Weidenbaum, S. S. and Bonilla, C. F. A FUNDAMENTAL STUDY OF THE MIXING OF PARTICULATE SOLIDS 73
Weil, A. H. ECONOMICS OF MODERN GAS DEHYDRATION 24
Weiler, V. SOME CONSIDERATION OF COST IN THE DESIGN OF PRESSURE VESSELS 54
Weinberg, E. A REVIEW OF AUTOMATIC TECHNOLOGY 226
Weinberger, E. B. See Montgomery, C. W.; Walters, R. J.
Weisbecker, H. B. NEW METER CHECKS MOISTURE BY ELECTRONICS 28
Weisman, J. See Sheehan, T. V.
Weiss, F. T. See McCoy, R. N.
Weiss, H. L. COMBINATION REFRIGERATOR AND SPACE COOLER 59
Weiss, M. A. See Longwell, J. P.
Welch, M. OIL-FIELD INSTRUMENTATION 99
Wellman, E. M. and Sibbitt, W. L. A SURVEY OF SOME OF THE THERMODYNAMIC AND PHYSICAL PROPERTIES OF WATER 152
Wellman, H. B. See Sieg, R. P.
Welty, A. B., and Sweetser, S. B. PROCESS FOR ENRICHMENT OF WATER GAS 23
Wem, C. Y. See Leva, M.
West, A. C. See Postlewaite, W. R.
Westbrook, S. S. See Nation, J. H.
Weyermuller, G. See Freeman, R. S.
Whalley, E., Lupien, Y., and Schneider, W. G. THE COMPRESSIBILITY OF GASES AT HIGH TEMPERATURES. X—XENON IN THE TEMPERATURE RANGE 0° to 700° C. AND THE PRESSURE RANGE 8 to 50 ATMOSPHERES 113
Whalley, H. K. AROMATICS FROM PETROLEUM 31
Whalley, W. C. See Murray, T. B.
Whelan, P. F. See Bannister, H.; Gray, V. R.
Wherry, W. M. CAN GAS PRODUCTION BE REGULATED? 173
Whitaker, A. THE ULTIMATE STRUCTURE OF COAL 160
White, B. C. STAND-BY SOLUTION FOR NEW ENGLAND 77
White, H. J. EFFECT OF FLY-ASH CHARACTERISTICS ON COLLECTOR PERFORMANCE 33;—MODERN ELECTRICAL PRECIPITATION 144
White, H. J. See Armstrong, J. A.
White, P. D. and Huntington, R. L. HORIZONTAL CO-CURRENT TWO-PHASE FLOW OF FLUIDS IN PIPE LINES 206
White, R. G. UNIQUE OVEN MIXES AS IT BAKES 121

White, W. C. A NEW ELECTRICAL DEVICE TO LOCATE LEAKS OF INFLAMMABLE GASES 34
Whitehead Brothers Co. See Wallace, B. P.
Whitley, B. J., Jr. THE FACTOR OF SOIL RESISTIVITY IN ESTABLISHING CORROSION CONTROL 116
Whittingham, G. HIGH TEMPERATURE REACTIONS OF COAL MINERALS DURING COMBUSTION 83
Wiggins, J. L. CORROSION CONTROL IN TEXAS GAS FIELDS 181
Wilbur, W. E. FOUNDATIONS FOR VERTICAL VESSELS 171
Wilder, A. B. WHEN STRONGER LINE PIPE IS NEEDED PIPELINERS WILL GET IT 180
Wiley, J. L. See Anderson, H. C.
Wilke, C. R. and Lee, C. Y. ESTIMATION OF DIFFUSION COEFFICIENTS FOR GASES 169;—MEASUREMENTS OF VAPOR DIFFUSION COEFFICIENT 29
Wilkins, C. W. PRODUCTION OF HYDROGEN SULFIDE 30
Wilks, P. A., Jr. CONTINUOUS ANALYSIS VIA INFRARED,-5 ETHYLENE 11; — CONSIDER INFRARED FOR GAS ANALYSIS 112
Williams, D., Jr. AIR CONDITIONER 58
Williams, R. B. and Katz, D. L. VAPOR LIQUID EQUILIBRIA IN BINARY SYSTEMS 95; See Katz, D. L.
Williams, R. H. See Smith, R. V.
Williams, S. V. See Cunningham, L. J.
Williams, T. S. See Dickinson, N. L.
Wilsey, L. E. See Gladfelter, R. E.
Wilson, F. E. See Wray, G. O.
Wilson, J. E. and Ludwig, E. E. ENGINEERING WITH HIGH-PRESSURE AIR 151
Wilson, N. G. CHEMICALS CUT PIPELINE R.O.W. UPKEEP 200
Wilson, R. C., Jr. APPARATUS FOR SOLIDS TRANSFER 32
Wilson, W. A. See Zimmerschied, W. J.
Winet, H., Kaeser, A. GAS BAKING OVEN TEMPERATURE REGULATOR 3
Wingfield, I. S. AUTOMATIC GAS CUTOFF VALVE 39
Winston, R. E. See Clarke, L.
Winter, E. R. S. EXCHANGE REACTIONS OF SOLID OXIDES. PART VI. THE REACTIONS OF CARBON MONOXIDE, CARBON DIOXIDE, AND OXYGEN ON CUPROUS OXIDE, NICKEL OXIDE, AND CHROMIUM OXIDE 222
Wintermute, H. A. GAS CLEANING APPARATUS 25
Witt, G., Miller, H. W. and Miller, L. A. FUEL BURNING SPACE HEATER 175
Wolfhard, G. G. See Simmons, R. F.
Wohl, K. BURNING VELOCITY OF UNCONFINED TURBULENT FLAMES. THEORY OF TURBULENT BURNING VELOCITY 122; — EXPERIMENTS WITH BUTANE-AIR AND METHANE-AIR FLAMES 122
Wolfe, J. T. SELL GASS AS A SERVICE, NOT A FUEL 173
Wood, K. HOW GREAT IS THE THREAT OF THE NEW "HIGH SPEED" ELECTRIC WATER HEATER 159
Wood, R. E. See Johnson, F. B.
Woodruff, M. L. See Schmid, C.
Woods, A. T. See Boggs, J. H.
Woodward, H. B. See Escolas, E. J.
Wooley, H. W. EFFECT OF DISSOCIATION ON THERMODYNAMICS PROPERTIES OF PURE DIATOMIC GASES 133
Wormsley, B. H. THE COST OF GAS TRANSMISSION AND COAL TRANSPORT 137
Worthington, A. E., Marx, P. C. and Dole, M. CALORIMETRY OF HIGH POLYMERS. III. A NEW TYPE OF ADIABATIC JACKET AND CALORIMETER 205
Wray, G. O. and Wilson, F. E. GAS FURNACE 175
Wright, B. C. HOT-SPRAY APPLICATION OF VINYL-BASE PAINTS 56
Wright, C. C. See Pilcher, J. M.
Wright, G. F. See Clarke, R. M.
Wright, J. POTENTIAL USES OF FISSION PRODUCTS IN THE CHEMICAL INDUSTRY 204
Wyld, G. See Porter, P.
Wylie, R. RECOVERY OF ACIDIC GASES 220
Wyss, W. F. See Brown, J. K.

XY

Ximenes, V. T. NATURAL GAS IN NEW MEXICO 78
Yarborough, V. A., Haskin, J. F. and Lambdin, W. J. TEMPERATURE DEPENDENCE OF ABSORBANCE IN ULTRAVIOLET SPECTRA OF ORGANIC MOLECULES 12
Yasuda, S. K. See Lambert, J. I.
Yellott, J. I. OPEN CYCLE COAL BURNING GAS TURBINE SYSTEM WITH REGENERATOR 61; —and Broadley, P. R. FLY ASH SEPARATOR FOR HIGH PRESSURES AND TEMPERATURES 140;—Broadley, P. R., Meyer, W. M. and Rotzler, P. M. DEVELOPMENT OF PRESSURIZING, COMBUSTION, AND ASH SEPARATION EQUIPMENT FOR A DIRECT FIRED, COAL-BURNING, GAS TURBINE LOCOMOTIVE 39
Youden, W. J. INSTRUMENTAL DRIFT 11
Young, E. H. See Katz, D. L.
Young, W. S. See Melpolder, F. W.

Z

Zabetakis, M. G. and Jones, G. W. THE PREVENTION OF INDUSTRIAL GAS EXPLOSION DISASTERS 211
Zahnstecher, L. W. and Petrarca, C. A. ACHIEVING CATALYTIC DESULFURIZATION OF PETROLEUM DISTILLATES 48
Zehender, E. METHOD OF DETERMINING SURFACE ROUGHNESS 52
Zielke, C. W. and Gorin, E. KINETICS OF CARBON GASIFICATION 125; See Gorin, E.
Zimmerschied, W. J., Hunt, R. A., Jr. and Wilson, W. A. IMPROVING DISTILLATE FUELS BY HYDROFINING 148
Zwietering, P. and Van Krevelen, D. W. CHEMICAL STRUCTURE AND PROPERTIES OF COAL IV —PORE STRUCTURE 6
Zylstra, J. J. and Mueller, J. C. INTERCHANGEABLE VALVE MOUNT FOR GAS HEATER 174

SUBJECT INDEX

A

ABSORPTION
- Absorption and stripping design 185
- Absorption in long wetted-wall columns 134
- Absorption by short wetted-wall columns 154
- Absorption by wetted spheres 154
- Ammonia from air by monoammonium phosphate 168
- Carbon dioxide in ammonia solution 97
- Gas absorption of perforated and bubble-cap trays 154
- Perforated plates versus bubble caps 154
- Performance, perforated and porous plates in absorption 225
- Year's publications on gas absorption 134

ADSORPTION
- Ammonia removed with cation exchange resin 168
- Analysis of hydrocarbon mixtures by adsorption 221
- Behavior of solid adsorbents in solid sorption dehumidifiers 119
- Coal pore structure 6
- Economics of modern gas dehydration 24
- Exchange of oxygen between CO chemisorbed on iron 222
- Gas chromatographic elution for identification of gas mixtures 92
- Gas separation uses activated char 107
- Methane dehydration upon adsorbents 24
- Monolayer on silica surfaces 133
- Oxygen exchange, gases with surface oxygen 222
- Storing gases on solid adsorbent 179
- Temperature, continuous adsorption on solid 179
- Water on **Spheron** 6 and **Graphon** 222

ANALYSIS & TESTING
- General materials
  - Coal
    - Errors in preparation of coal samples 6
    - Error reduction of coke samples 221
    - High temperature reactions of coal minerals 83
    - Infrared studies of coals 124
    - International methods of analysis of 150, 204
    - Coal by differential thermal analysis 23
    - Survey of coal structure to present day 160
  - Gases
    - Analytical methods and sampling for gases, vapors, particulate matter 202
    - Analysis of hydrocarbon mixtures by adsorption 221
    - Atmospheric dirt samples analyzed 19
    - Charcoal weight test for C_3+ AND C_4+ 149
    - Daily hydrocarbon losses in Los Angeles 175
    - Flue gas volumes leveling 28
    - Gas chamber microapparatus 148
    - Gases adsorbed, influence of mixture composition 149
    - Hydrocarbons in gases from mud 49
    - Mass spectrometer analysis of carbureted water gas 11
  - Petroleum
    - Analytical literature, year 1953 to 1954 167
    - Bearings, lubricants, and lubrication in 1954 227
    - Correlation of crude oils with solvents fractionation 92
    - Emission spectrographis applications 29
    - Graphical-statistical analysis in oils research 220
    - Hydrocarbon and sulfur types in heavy gas oil 50
    - Lubricating hydrocarbon types identified by spectrometry 50
    - Metals in petroleum distillates 204
    - Slope percent evaporated vs. temperature curve at 10% 167
  - Tar
    - Chromatographic fractionation of aspalt 132
- Particular Methods
  - Carbon Determination
    - Ammonium sulfamate in determination of carbon and hydrogen 132
    - Total carbon and carbon-14 by Pregl method 132
  - Carbon Dioxide Determination
    - Carbon dioxide absorption by sealing liquid 70
    - CO_2 in gases by direct titration 203
    - CO_2 and H_2S from low temperature fractional analysis 221
  - Carbon Monoxide Determination
    - NBS colorimetric indicating gel, for CO in air 111
    - Physiological effects of mild carbon monoxide poisoning 19
  - Coal Methods
    - Ash
      - Recovery of Germanium 161
    - Moisture
      - Quick moisture method for coal by temperature rise 92
    - Sulfur
      - Sulfur and chlorine in coals 132
    - Ultimate
      - Oxygen groups in bright coals 213
    - Volatiles
      - Coal aromaticity and volatile matter 6
  - Dust Determination
    - Ions in microscopic dust 70
    - Photo-electric cell to record dust content 11
    - Transmission of light and size of dust 29
  - Halogens Determination
    - Chlorine in coals and cokes 132
  - H_2S Determination
    - Hydrogen sulfide in air by film stain 112
    - H_2S from low temperature fractional analysis 221
    - H_2S by lead acetate stain 203
  - Hydrocarbons
    - Binary hydrocarbon mixtures on charcoal 149
    - Mass spectrometric analysis, high boiling petroleum 183
    - Microanalysis of soils for hydrocarbons 46
    - Aromatics
      - Aromatic hydrocarbons in infrared 49
    - Olefins
      - Ethylene in mixtures of ethane and ethylene 49
      - Infrared continuous analysis of plant ethylene 11
      - Olefins by ultraviolet spectra of complexes 221
    - Propane
      - Infrared spectrometry of combustion products containing propane 28
      - Cobalt bromide moisture test for propane 92
  - Moisture Determination
    - Dew-point cell using a mirrored surface 226
    - Dew point of gas 155
    - Improvements in Karl Fischer method 112
    - Moisture contents of oils and gases 28
  - Nitrogen Determination
    - Composition of ammoniacal liquor 49
    - Nitrogen compounds in petroleum 50
    - Organic nitrogen by Kjeldahl without distillation 149
    - Trace nitrogen in petroleum 222
  - Nitrogen Oxides Determination
    - Pentoxide and influence of nitrogen oxides on toxicity of ozone 11
    - Microdetermination of nitrogen dioxide 50
    - Toxicity of oxides of nitrogen and hydrogen peroxide 93, 183
  - Organic Sulfur
    - Aliphatic sulfides in petroleum 150
    - A. P. I. research project 48: sulfur compounds in pe-

troleum 29
Separation of sulfur compounds from petroleum 94
Sulfur by lamp method 94
Mercaptans
Coulometric system for mercaptains in petroleum 28
Low boiling organic sulfur compounds 221
Mercaptan sulfur in hydrocarbons 70
Carbonyl Sulfide
Trace of carbonyl sulfide in gases 203
Oxygen Determination
Dissolved oxygen in water 221
Low concentrations of oxygen 92
Oxygen in gases 150
Phenols
Monohydric phenol in ammoniacal liquor 49
Sulfur Determination
Bomb-volumetric method for sulfur 50
Burner for sulfur in drip oils 94
Colorimetric determination of sulfate 150
Group sulfur analysis of petroleum fractions 50
Rapid method for sulfur and chlorine 132
Sulfur in organic liquids 150
Titrimetric method for sulfate 11
Sulfur Oxides Determination
Sulfuric acid aerosol 132
Winkler method for H_2S and SO_2 92
Water
Dissolved oxygen in water 221
Techniques
Absorption
Separation techniques, high-boiling shale-oil 93
Calorimetry
Bomb calorimetry corrections 203
Water equivalent of bomb 202
Chromatography
Chromatography in gas phase 167
Elution chromatography on activated alumina 71
Gas chromatographic elution for identification of gaseous liquid mixtures 92
Metal ions titrated with chelating agents 28
Distillation
API Research Project 6; exhaustive analysis of crude oil 29
Equilibrium flash vaporization and ASTM distillation 112
Low temperature fractional distillation analysis, improvements 149
TBP and Engler type distillations 70
Equipment
Automatic recording analytical balance 76
Ceramic buckboard and muller 149
Composition of furnace atmospheres 171
Fractional separation in partition column 149
Gases
Analyzing drilling mud to detect hydrocarbons 49
Atmospheric gas and contaminant collector 83
Automatic gas separations through membranes 203
Haldane apparatus for flue gas 28
Low temperature fractional distillation improvements 149
Reagents for accurate volumetric gas analysis 132
Sampler for gases high pressure 203
Van Slyke manometric technique 50
Infrared Methods
Analyser with multiple reflection cells 183
Analysis of combustion products 28
Chemistry and utilization of coal 124
Coal extracts by infrared spectroscopy 22
Continuous analysis of plant ethylene streams 11
Infrared analyzers in ammonia plants 135
Infrared analyzers for continuous analysis of gas 112
Oxygen groups in bright coals 213
Spectrophotometer to detect end-points in coulometric analysis 30
Mass Spectrometer Methods
Absorbance in ultraviolet spectra 12
Continuous monitoring mass spectrometer in Wulff Process 31
Ionization potentials of ethyl, isopropyl and propargyl 151
Mass spectral search for H_2O_2 and HO_2 30
Type analysis of high boiling saturated petroleum 183
Particle Size
Detection of certain ions in particles 70
Particle size distribution 93
Photoelectric assessing of dust samples 29
Radio-Activity
Beta-particle radiolysis of acetylene 223
Instruments to measure abundances of isotopes 152
Spectroscopy
Elements in magnesium alloys 167
Emission spectrographic applications to petroleum analysis 29
Interferences in flame photometry 150
Metallic elements in nonmetallic samples 71
Metals used petroleum catalysts and residues 71
Preparation of samples in troleum 71
Procedure for aliphatic sulfides 150
Quantitative analysis of petroleum ash 93
Spark method for bromine, chlorine and sulfur 29
Trace metals in distillates 204
Standards
Error in the reduction of coke samples 221
Odorants evaluated by new apparatus 93
Universal method of spectrochemical analysis 112
Statistical
Application of punched cards to process control 10
Circular or elliptic nomograms 14
Precision of mass spectrometer analyses of water gas 11
Surface Area
Surface of precipitated alumina 151
Surface roughness by interference microscope 52
X-Ray
Atomic distribution functions of vitrinite 21
Inspection of sound pipeline welds 31
Modern x-ray techniques at Ontario Research Foundation 150
Radiographic inspection of petroleum pipe lines 47
X-rays in molecular structure 223
APPLIANCES
Adjustment
Analyzing service calls 118
Con-Ed's new centers offer training for servicemen 210
Data book on gas utilization 38
Design
Anticipating degree-days 158
Corrections for altitude 102
Design for gas appliance venting 118
Delivery Regulation 119
Gas valve 119
Handbook of kitchen design 103
Air Conditioning
Absorption refrigeration apparatus 58
Changeover heating to cooling 58
Conditioner employing absorbent solutions 58
Domestic gas engine units 174
Evaporative condenser in air conditioning 175
Gas air conditioning 189
Gas air conditioning components, servicing, and costs 158

Gas-powered summer air conditioner 138, 158
Heat removal by cooled ceiling panel 79
Humidity changer for air-conditioning 78
Liquid heating and cooling 158
Research and relative first and operating costs 209
Systems using gas fuel 138
Valance heating and cooling system 103
XFC-96-G placed for field test 209
Weather data analysis for cooling 139
Burners
Gas burner 174
Los Angeles use of modern, dual-fuel burner 3
Support for top burners 174
Yellow-tipping characteristics of fuel gases 4
Cookers
Continuous baking oven with ribbon burners 121
Cooking range 39
Cost of electricity and gas, commercial kitchen use 210
Gas range sales potential 18
New features of domestic electric ranges 158
Swing Magic Chef back towards gas cooking 138
Top burner thermostatic 190
Welders improved oven-liners for range 138
Dryers
Developing washer-dryer 102
Drier 3
Sales of gas-fired clothes dryers 78
Try it, buy it, sells gas dryers 39
Heaters
Space Heaters
Chicago's Navy Pier, heating problem 18
Data book on sales and installation 38
Evolution of hot water systems 119
Floor Furnace 39
Forced-draft unit heater 39
Fuel burning space heater 175
Gas furnace 175
Gas heating to increase 102
Heat distributed by high temperature water 210
Heater floor and wall 175
Heater and radiant therefor 3
Installation and operating costs of heat pump 159
Pressure hot water in space and process heating 79
Radiant hot-water heating panels 119
Record year for construction, huge market for appliances 38
Sizing gas-fired house heating equipment 175
Space heating system 3
Water Heaters
Coil condenser refrigeration cycle in water heating 211
Gas heaters 175
Hot water for large volume needs 4
Instantaneous water heaters popular in Sweden 59
New "high speed" electric water heater 159
Potential of future sales 190
Renting automatic storage-type water heaters 19
Rheem lines water heaters with glass 103
Safe-guard domestic water heaters against overheatting 19
Sales of water heaters forecast by the AGA 159
Selling heater capable of handling load 59
Stock water heater 59, 175
Water heater rental 190
Water heater rental plan in LP-gas and utility gas industries 120
Ignition
Automatic gas cutoff valve 39
Automatic ignition and control for burners 3
Baking oven temperature regulator 3
Burner and pilot means 119
Burner igniter and safety control 39
Chain ignition 39
Component checking burner control apparatus 3
Double outlet valve 174
Effect of burner assembly materials and gas on outage 120
Flame failure control 39
Fuel control means 119
Gas heater control 174
Gas and oil burner control 119
Ignition and automatic pilot controls 120
Interchangeable valve mount 174
Oven lighting system 174
Pilot and ignition systems 119
Pressure regulator 174
Regulator for gas pilot burner 105
Relay control for burners 174
Safety control and ignition apparatus for gaseous burners 3
Trigger operated gas igniter 119
Incinerators
Designing successful incineration units 59
Incinerator characteristics: acceptance, servicing and load 3
Refrigerators
Absorption refrigeration 190
Boiling outside finned tubes 97
Combination refrigerator and space cooler 59
Conditioning system for box-car of frozen foods 59
Cooled air for aircraft 59
Finned tube atmosphere coolers 97
Heat exchange of absorption refrigerating 59
Refrigeration unit utilizing solar energy 3
Vapor lift operation of absorption refrigerator 18
Standards
AGA recommended gas piping 210
Appliances 1955 activity will increase by 5% 102
Costs of gas and electricity for cooking 157
Revisions to 14 American Standards for gas appliances 118
Shop testing of basic appliances 2
Ventilation
Combustion gases from gas appliances 38
Maintaining constant relative humidity 139
Ventilation of commercial laundries 21

B

BUREAU OF MINES
Coal gasification at Louisiana, Missouri 195
Bibliography Fischer-Tropsch synthesis I literature II Patents 201
Effect of temperature, density, and blending on the carbonization of coal 82
Explosibility characteristics of mine-fire atmospheres 210
Flammable limits of hydrocarbons in air 211
Gasification in cyclone type reactor 83
Synthetic liquid fuels: annual report Secretary of Interior 1954: Oil from coal: Oil from oil shale 131
Yellow-tipping characteristics of fuel gases 4

C

CARBON BLACK
Manufacture
Improvement in color and pH by oxygen 179
Increased yields excess hydrocarbon then detarring 216
Oil, carbon blacks classified 45
Oil with gas feed, lynn dry furnace method 126
Properties
Water on **Spheron 6** and **graphon** 222
CARBONIZATION
Byproducts
Chemical industry of Staatsmijnen 141
Gasification processes currently in Germany 160
Recent recovery of H_2S, HCN, pyridines, and benzole 123
Improved tar from coal carbonization 7
Tingley: Liquor effluent treatment plant 21
Coal Preparation
Effect of temperature, charge density, and blending on carbonization 82

Treatment of coal before carbonisation 213
Coke Formation
Coke formation and coal blending 177
Gasification of coal, coke and oil as potential methods in future 125
Gasification in shaft-furnaces of ferro-coke 214
Methods for coking power 214
NCB unit for smokeless fuel 192
Process of fissuring in coke 83
Shawinigan traveling-grate carbonization process 43
Test methods for coking properties 214
Equipment
Carbonization in British gas industry 6
Coal oxidized briquetted and carbonized 123
Coke from pitch in suspension 142
Coke ovens of Tata at Jamshedpur 142
Devolatizing coal as a furnace feed briquetting material or char 106
Expelling volatile constituents by electric current 160
Fixed bed carbonization in stream of gases 141
High-chamber coke oven by Carl Still 161
Stirring, recovering heat and steam in char retort 43
Heat Transfer Data
Large scale carrier gas carbonisation 141
Temperature in coke oven 193
Lignite and Peat
Kiln processing lignite with heavy oils 142
Low Temperature
Calcining carbonaceous materials 21
Char desulfurized by hydrogen and methane 213
Coal into oils and coke 178
Rexco low temperature plant enlarged 7

COAL
Analysis
Errors in preparation of coal samples 6
International ISO methods of analysis 204
Ash
Recovery of germanium 161
Moisture
Quick moisture method for coal by temperature 92
Ultimate
Simultaneous determination of sulfur and chlorine 132
Classification
Rank by differential thermal analysis 23
Surface areas by heat-of wetting on Alberta coals 124
Cleaning
Removal of sulfur from coal 106
Conservation
Energy production in India 178
World coal research in 1954 106
Constitution
Aromaticity and volatile matter 6
Atomic distribution functions of vitrinite 21
Calorific value 6
Chemistry and utilization of coal 124
Coal extracts by infrared spectroscopy 22
Coal in ultrasonic fields 212
Dielectric constants of coals 177
Elestic constants 21
High temperature reactions of coal minerals 83
Reflectivity analysis 193
Nondestructive examination of coal substance 83
Oxygen groups in bright coals 213
Pore structure 6
Survey of coal structure to present 160
Theory of structure of solid fuels 124
Thermal expansion coefficient 178
Handling
Coal and pitch handling and processing dust control 43
Granular flow through bunkers 177
Handling and storage of fuels 41
Hydrogenation
Coal into oils and coke 178
Effects of pre-heat on restricted hydrogenolysis 23
Fuels and chemicals from coal hydrogenation 22
Mining
Methane drainage: Haig mine, Cumberland, N. England 194
Utilization of methane from coal mines 45
Properties
Bulk Density
Effect of temperature, charge density and blending on carbonization 82
Optical
Infrared studies of carbonised coals 124
Microreflectivity analysis of coal 193
Carbonizing
Coal and shale pyrolysis 212
Devolatizing coal as furnace feed, briquetting material or char 106
Fuel research board 1954 on coal 160
Methods for coking power 214
Shawinigan traveling - grate carbonization process 43
Test methods for coking properties 214
Treatment of coal before carbonisation 213
Oxidation
Slow combustion of solid fuels 41
Plasticity
Coals for complete gasification plant 215
Improved plastometer for agglutinating behavior 177
Measurement of semi-coke properties 216
Mechanism of softening and decomposition 177
Reactivity
Behavior in ultrasonic fields 212
Surface areas by heat-of-wetting, Alberta coals 124
Chemical structure of solid natural carbonaceous fuels 124
Pulverization
Mixing of particulate solids 73
Feeding pulverized material against pressure 206
Statistics
Energy production in India and projected demand 178
Fuel and power resources of Germany 194
Storage
Bulk solids flow in bins and hoppers 53
Coal, coke and bulk handling equipment in European gas works 225
Granular flow through bunkers 177
Handling and storage of fuels 41
Utilization
Cation exchange material from coal 21
Smelting ore with anthracite 192

COKE
Analysis
Error in the reduction of coke samples 221
Evaluation
Ferrocoke to 40% iron in small shaft-furnaces 214
Properties
Char desulfurized by hydrogen and methane 213
Reactivity of coke with CO_2 214

COMBUSTION
Air Pollution
Atmospheric dirt, soiling properties 19
Atmospheric gas and contaminant collector 83
Automobile exhausts are source of hydrocarbons 82
Catalytic oxidation to remove solvent fumes 211
Chimneys to control down-wash 80
Combustion gases from gas appliances 38
Daily hydrocarbon losses in Los Angeles 224 tons 175
Determination of sulfuric acid aerosol 132
Incinerator characteristics: acceptance, servicing and load 3
NBS colorimetric indicating gel for carbon monoxide in air 111
Paris conference on gas cleaning 197

Removal of SO_2 from flue gas 120
Burner Design
Adjustable orifice gas-air mixer nozzle 3
Burner for liquid and gaseous fuels 3
Combustion at relatively high heat releases 79
Deflecting high-speed jet of gas through nozzle 2
Design of aerated burners 80
Enclosed-flame radiant burner for gaseous fuels 41
Gas burner and support 2
Intermittent combustion device with control of gas flow 2
Mixing tube for gas burners 39
Schwank radiant heaters for out-doors 212
Single-port gas burner 119
Turret-type gas burner 39
Coal
Coal-fired turbine-electric locomotive 176
Cyclone furnace as efficient combustor 20
Fly-ash in effluent gases of burning pulverized coal 33
Horizontal cyclone furnace 210
Hot gas cleaning by electrostatic precipitation 140
Peat-fired power stations 20
Pressurizing, combustion, and ash separation for turbine 39
Removal of fly-ash by continuous cyclone 140
Slow combustion of solid fuels 41
Calorimetry
Chemical structure properties and calorific value 6
Effect of changes in composition on combustion characteristics 41
Equipment
CO boilers and waste-gas eliminators 190
Cyclone furnace for pulverized fuels 121
Flow modulating valve 3
Thermostatic gas cock 3
Flame Temperatures
Combustion temperatures and composition 104
Flame temperatures in a spherical bomb 60
Radiation of carbon monoxide flames 121
Resonance line radiation from absolute intensity 40
Rotational temperatures and concentrations of OH 81
Temperatures in flames, theory of sodium line methods 40
Temperatures in flames by sodium line reversal spectroscopy 40
Gaseous
Adding steam to air in the gas-turbine process 42
Excess air in combustion 190
Exhaust from resonant intermittent pulse jet 192
Flame stability on reaction rate theory 103
Free-piston gas-turbine 104
Stability of CO monoxide-hydrocarbon-air flames 103
Submerged - combustion equipment 20
Inflammability
Burning velocities of propenyl acetylene 140
Burning velocity of unconfined turbulent flames 122
Effect of flow on ignition 211
Changeover to an auxiliary fuel 104
Explosibility of wet ammonia-air 151
Flame propagation for isooctane-air-ammonia 122
Flame propagation in turbulent stream 159
Flame-stability on inverted Bunsen burner 81
Flammability of mine-fire atmospheres 210
Flammable limits of hydrocarbons 211
Kinetics of combustion of cyclopentane air 140
Measured and calculated burning velocity 60
Oxidation of methane in butane mixtures 211
Preflame reaction in propane-air 81
Propane and n-pentane limits with NO_2 191
Quenching by channel burner as a function of pressure 30
Theory of turbulent burning velocity 122
Turbulence and flame propagation in gas stream 159
Velocities of hydrocarbon flames 80
Liquid Fuels
Influence of chemical and physical factors on formation of deposits 42
Reactions
Flame stability with hydrocarbon mixtures 190
Flame-sustained transverse oscillations 60
Hydrogen-oxygen-methane system explosion limit 191
Influence of methyl bromide on flames 211
Intermediates in combustion reactions 40
Stability limits of multi-component fuels 211
Mass spectral search for H_2O_2 and HO_2 30
Moisture addition to prevent detonation 210
Oxidation of carbon monoxide 151
Reaction rates in hydrocarbon combustion 191
Reviews three major fields of combustion studies 19
Propagation of turbulent flames 192
Yellow - tipping characteristics of fuel gases 4
Temperature Movement
Flames in turbulent streams 176

CONSTRUCTION MATERIALS
Ceramics and Glass
Differential thermal analysis of building materials 204
High-temperature ceramic coatings 56
Concrete
Concrete mixing and placing; design and control of concrete mixes 76
Design and control of concrete mixes 100
How to plan forms in detail 15, 35
Corrosion-Resistant Materials
Alumibond casting and Alumicoat dipping process 156
Dry and high temperature corrosion 100
Heat Resistant Materials
Metals for short time high temperatures 136
Reformer piping failures replaced with 1¼ Cr. ½ Mo 228
Saving alloys in high-pressure steam equipment 227
Insulation
Kilns reduction of cooling times 228
Metals
Copper and copper alloys 15
Corrosion resistance of cupronickel alloys 36
Effect of burner materials and gas on outage 120
Field welding heavy-wall vessels 16
Graphitization in steel 56
New steels in power plant piping 188
Nickel cast iron pipe in soils 36
Oil-well tubing; why they burst, leak, crush 228
Oil-well tubing and casing fail in tension 172
Pressure vessel designs use alloy and carbon steels 225
Preventing weld cracks in stainless 156
Radiographic inspection of welds 100
Residual stresses in welded structures 188
Resistance of cupronickel alloys 36
Spraying zinc and aluminum on iron 116
Temporary furnace for stress-relieving girth weld 16
Tests show 30° pipe bevel best 172
Plastics
Cement lining over interior of pipe 208
Cleaning and coating well pipes 208
Creep of pipe from tenite butyrate 116
Data, properties and specifications of plastic pipe 208
Evaluation of protective coating 208
Facts about plastic pipe 76
Joining plastic pipe 228
Liner for steel services 26

Linings for steel containers 208
Plastic pipe for service renewals 89
Plastic pipe, establishment of standards 116
Plastic pipe in 1954 188
Plastic recommended for gas industry 172
Polyethylene tape for pipe coating 67
Polysulfide liquid polymers 171
Polyvinyl chloride pipe for crude oil 208
Process equipment from reinforced plastics 35
Properties of kralastic 116
Tape as an efficient pipe coating 26
Techniques in testing polyester pipe 188
Refractories
Applications of zircon and zirconia 208
Factors influencing properties of refractory concretes 16
CORROSION
Causes
Bibliographies. Corrosion—its causes and prevention 16
Bureau of Standards, corrosion of bolts in soils 188
Causes of galvanic corrosion 116
Corrosion by flue-gas condensates 191
Corrosivity of gases and soils 181
Gas plant corrosion and wear safety 156
Effects of hydrogen on metals 172
Hydrochloric acid in flue gases 187
H_2S removal in mitigating blistering 188
Internal corrosion problems 116
Questionnaire on corrosion, 28 companies 156
Spontaneous potentials and casing currents 130
Variables involved corrosion by water 188
X-ray techniques for corrosion products 150
Measurement
Corrosion activities of technical societies 227
Corrosion current measuring instruments 227
Direct corrosion activities and record control 227
Equipment in stress corrosion tests 172
Prevention
General
Activities of Northern Illinois Gas Company 136
Economics for corrosion engineer 100
NACE meeting marks first ten years. 116
Pre-construction planning on corrosion 116
Successful mitigation of corrosion in glycol unit 171
Rating principal characteristics of pitting 100
Surveys on existing pipelines 136
Cathodic Protection
Basic corrosion theory, types, prevention, economics 100
Cathodic protection on biggest inch 207
Combatting corrosion in production in Kansas 198
Costs and choice of protection system 116
Design of cathodic protection systems 100
Economic survey of preventative measures 187
Electrical measurements relating to corrosion 136
Interference problems 115
Interrupter for cathodic protection system 207
Large oil pipeline system 115
Maintenance requirements and procedures for protection 115
Magnesium anodes to protect treater 136
Methods design and tests for protection 100
Placing ground anodes with water jet 207
Potential surveys predicting current requirements 181
Pozzolan cement compositions indicate better properties 198
Protection for oil-well casing 198
Protection utilizing either galvanic anodes or rectifiers 227
Soil resistivity in corrosion control 116
Coatings
Advantages of cleaning and coating interior of pipe 16
Alumibond and Alumicoat protection 156
A.P.I. survey coating practices and costs 187
Cleaning and coating interior of well pipes 208
Cleaning and coating 36-inch steel pipe 136
Cleaning, coating and drying procedures on internal coatings 171
Coat 36-inch gas line with epoxy resin 187
Coatings for exterior and interior 171
Chromate pigments in primers 187
Combat atmospheric corrosion 56
Complete tape wrap in 30 miles of pipe 16
Device for cement lining interior of pipe 208
Eponphenolic plastic to interior of drill pipe 227
Epoxy resins with polysulfides produces improved coatings 171
Evaluation of coating materials 208
Faulty spray gun techniques 171
Finishes for metal products 228
Hot-spray vinyl-base paints 56
Internal coating at mills with epoxy resin 88
Metallic surfaces exposed to corrosion 227
Metallizing for corrosion prevention 116
Neoprene: best all-around organic coating 76
Polyethylene tape for pipe coating 67
Polyvinyl chloride tape in corrosion mitigation 136
Resistant coatings for steel containers 208
Selecting a holiday detector 116
Vinyl coat on caustic and acid 187
Zinc coatings on steel 207
Inhibitors
Breaks traced to hydrogen blisters from corrosion by H_2S and CO_2 47
Corrosion in steam-generating equipment 208
Corrosion and deposit in gas turbines 28
Inhibitors to prevent internal corrosion of well piping 181
Inhibitor to control corrosion in sour crude 208
Inhibitors in practice 16
Neutral and alkaline aqueous solutions, vapor phase inhibitors and organic liquids 35
Pitting corrosion of copper 56
Sulfide corrosion cracking of equipment 56

D

DISTRIBUTION
Change-Overs
Conversion to natural gas 45
Corrosion
Bibliographies: corrosion — its causes and prevention 16
Breaks and hydrogen blisters, corrosior and inhibitors 47
Cleaning, coating and drying procedures of plastic coatings 171
Cleaning and coating interior of pipe 16
Costs for the protection of bare and coated pipe 187
Economics of major pipe line corrosion problems 172
Nickel cast-iron pipe specimens after exposure to soil 36
30 miles of pipe coated with plastic tape 16
Deposits
Internal cleaning of pipelines 129
Natural gas pipeline deposits 89
Pipe line deposits—causes and cures 129

Leakage
Leakage surveys, four basic types 164
Pipeline pressure testing 200
Summary of leakage detection practices 217
United restored gas after flood 9
District Supply
Mains and Services
Alabama natural gas venture in facilities 64
Copper tube replacements in gas industry 67
Creep of pipe from tenite butyrate 116
Economic analysis of main sizing 180
Establishment of standards on plastic pipe 116
Liner for steel services 26
Low pressure service replacements by Tenite II 89
Optimum pressure for medium pressure system 196
Plastic recommended for gas industry 172
Plug a 24-inch main with rubber bags, cement 196
Plastic tape polyethylene as efficient pipe coating 26
Properties of kralastic pipe 116
Protecting distribution structures 162
Relocation of utility facilities under highway program 219
Repair coupling for pipe lines 67
Restoring service after atomic attack 127
Sound main extension policy 66
Meters
Adjustment of positive displacement meter 218
Assembly line meter repair 128
Bibliographies on gas measurement 108
Committee on Gas Measurement report No. 3 9
Economics of planned meter retirement 108
Meter covers for domestic meter installations 35
Meters may be lifted, positioned, lowered and held 15
Oil impeller-bearing wash 186
Planned meter retirement program 66
Pound as unit of measure of gas 46
Preferred basis for meter change-outs 66
Scientific meter cost studies on retirement 108
Tentative standard for field welding 108
Three types of automatic proving devices 128
Trolley-conveyor reduces meter repair costs 66
Network Design
Applying gas load data to design 180
Application to gas industry's problems 64
Gas load data in distribution system design 127
Network analysis of station yard piping 180
Predict gas main capacity 218
Punched card equipment in distribution network analysis 64
Punched card program for distribution network 129
Solves distribution problem with network analyzer 88
Pressure Regulation
Instrumentation of gas pipeline 199
Pressure station noise abatement 219
Prevent overpressure in distribution 129
Remote control regulator stations 129
Safety and relief 186
Sound abatement at five United Gas stations 47
Storage
Holders
Bibliographies; aboveground and underground storage 9
Steel water-seal gasholders 128
Storing gases on solid adsorbent 179
Temperature in continuous adsorption 179
Liquefaction
Costs of various types of standby and peak shaving facilities 77
Underground
Statistics on underground storage, AGA 201
Herscher Dome geology, drilling, operation, and facilities 200
Reservoir feeds medium-pressure network 181
Sealant of neoprene and silicone on cavern storage 181
Clauses in natural gas storage agreement 174
Underground storage by Southern Indiana Gas and Electric Company 165
Reservoir construction features 109
LP-gas underground storage 66
Transmission
Compression
Application of closed TV to pipeline control 24
Bibliographies: compressors 64
Centrifugal compressors for gas pipelines 147
Centrifugal pipeline compressors 24
Chromium plating cylinder liner 196
Compressor surge and stall propagation 162
Cooling-water jackets of internal combustion engines 196
Developments in gas engine compressor plants 45
Experience at automatically controlled compressor station 24
Factors in designing compressor station 85
Gas jet compressors 164
Isentropic compression of nonideal gases 162
Noise-controlled compressor station 179
Noise sources, characteristics and abatement 216
Piston versus rotary air compressors 127
Piston and rotary portable air compressors 127
Power end of gas-engine-driven compressors 8
Single-switch control for mainline compressor stations 127
Turbines vs. reciprocals for pipeline compressors 85
Water injection curbs engine detonation 196
Peak Load
Building an off-peak and fringe load 67
Distribution from storage to market 146
The economics of peak shaving and storage gas 101
Electronics for meter readings, maintenance and leak detection 85
Field price and economic production of send-out gas 101
Microwave communication 15,505 miles in 37 systems 129
Present art supplying peak load gases 189
Radio industry in gas and petroleum 85
Underground storage Oklahoma Natural Gas Co. 146
Telemetering aids Algonquin gas operations 9
Weather service of value to gas industry 128
Pipelines
Agreement on supplying B.C., Wash., and Ore. with natural gas 38
American Louisiana gas supply 26
American standard code for pressure piping 27, 48, 89
ASA code for gas transmission and distribution piping; background material 48
New gas transmission specifications; weaknesses, limitations 89
ASA transmission and distribution piping code; welding 109
ASA transmission and distribution code; population density indices 127
API tubular goods standards reviewed 109

Canadian gas pipeline policy 216
Chemicals control weeds, on right of way 200
Co-current two-phase flow in pipelines 206
Columbia gas begins receiving 375 MMCF per day from Gulf Interstate pipeline 1
Construction budgets for 1955 major gas transmission companies 137
Control fire during line tie-ins 199
Control fire for pipeline repair 217
Corrosivity of gases and soils 181
Cost of gas transmission and coal transport 137
Costs relocate utility facilities in highways 38
Delaware river crossing laid thru solid rock 47
Design factors: market load, storage, line size, horsepower, location 47
Detergent cleaning of pipelines 180
Difficulties TGT encountered on line through White Plains 200
Engineering for pipeline river crossings 200
Equipment and procedures in laying 36-inch pipe 180
Expansion problems in high pressure lines 180
Extending pipeline off-shore and entrenching 110
Flow and storage of gas in pipe 65
Forces on a long pipeline 89
Graphical solution for flow equation 146
Gulf Interstate system construction operations 8, 9
Unusual features Gulf Interstate pipeline system 146
Hot tapping techniques, equipment 87
Inserting gas valve under pressure 87
Inspection for pipeline welding by X-ray 31
Internal coating at mills with epoxy resin 88
Large-diameter pipelines, anchoring 180
Limit possible down-time to failure in 34-inch pipeline 217
Line flow efficiencies method of 200
Line-stopping tool rated up to 1000-psig 25
New developments in line pipe 180
New technical developments of 1954 65
1955 gas construction to top $1 billion 137
North Wales pipeline 126
102-mile manufactured gas line 178
On-stream cleaning of pipelines 218
Operating pressures a graphical method 146
Super-inch design and operating 109
Pacific Northwest pipeline key to new frontier 37
Pakistan line first gas pipeline in far east 164
Pipe handling and storage facility 89
Pipe to off-shore loading station 218
Radiographic inspection of welds 47, 100
Reinforced branch connections under pressure pulsation 129
Six-month approvals total $324 million 1
Sizing of blowdown valves 88
Slide rule for pressure-drop in gas pipelines 34
Standards in working stresses in oil pipelines 146
Stresses affect branch connection 89
Techniques in laying of 36-inch pipe 200
Telemetering systems 181
Temperatures and thermal conductivity of ground 47
Trans-Canada given until October 31 to finance line 137
Transco lays 36-inch Texas-New York loop line 9
Welding tests show 30° pipe bevel best 172
Welding 37½° bevel is better 218
Wind vibration of pipe-line bridge 200

E

EQUIPMENT
Computers
Acoustical analysis commercial applications 75
Analog computers application to heat transfer 54
Analog computer in control and process problems 98
Analog and digital computers in distribution design 170
Application of digital computers 14
Binary arithmetic in testing computers 207
Closed-loop process-control systems 226
Computers in gas industry 171
Computers-general purpose and DDA 226
Computer for non-linear coordinate transformation 75
Computers—application to gas industry's problems 64
Computer for refining 98
Costs, maintenance and operation of digital computers 183
Data-processing machines by IBM 184
Digital computer at Socony-Vacuum's labs 99
Electric-analog applied to refrigerating-plant performance 139
Flash calculations on IBM card calculator 168
Gas sample problem on digital computer 170
Heat-exchanger selection by computation 98
Heat transfer by analog shape factors 97
I.B.M. punched-card equipment in distribution network analysis 64
Industrial uses of analog computers 184
Linear programming in production engineering 183
Practical analog computers 184
Process-control by analog computer 53
Programming of kinetic calculations 75
Punched card program for distribution network 129
Radiation analysis by network method 98
Refinery calculation product output 207
Use of computers in kinetic calculations 75
Utility of computers solving business problems 114
Controls and Instruments
Analyzer-recorder for hydrogen sulfide in air 112
Application of punched cards to process control 10
Algonquin pressures telemetered and remote controlled 9
Automatic intelligence gathering systems 186
Bibliography; dynamic pressure measurement 113
Changeover to auxiliary fuel 104
Computers facilitate stratigraphic correlations 181
Controlling general equipment by IBM cards 114
Corrosion current measuring instruments 227
Defining and adjusting level of material inside chamber 54
Detection and correction of instrumental drift 11
Dew-point of gas by pressure 155
Dew-point cell using mirrored surface 226
Fluid density a function of frequency signal 207
Instrumentation of pipeline 199
Geophysical instrumentation progress 181
High-vacuum standard—McLeod gage 35
Hydrogen Pirani leak detector 156
Infrared analyzers in ammonia plants 135
Infrared analyzer and refractometer for industrial use 115
Instrumentation for gas plants 55
Oil-field instrumentation 99
Planning instrument maintenance and replacement 99

Precision of mass spectrometer analysis of water gas 11
Precision well-pressure recorder 99
Radio-controlled producing facilities 115
Regulator for gas pilot burner 105
Review for seismic methods 181
Rotational high-pressure viscosimeter 35
Speed control method for turbines 115
Subsurface flow-meter 155
Types of high-vacuum gages 35
Viscometry of gases at high temperatures and pressures 12
Corrosion
Control in sea water coolant 35
Corrosion in glycol gas dehydration unit 171
Glycol and glycol-amine solutions, including plant experience 35
Questionnaire on causes of corrosion 156
Surfaces exposed to corrosion 227
Design
Contactors
Absorption by short wetted-wall columns 154
Absorption by wetted spheres 154
Absorption and stripping design 185
Atomization of liquids 206
Concurrent-flow spray dryer 114
Contacting at successively reduced pressure-stages 33
Cyclonic and dynamic spray scrubber 155
Design of cooling towers 206
Directing vapor stream horizontally with liquid flow on plates 32
Extraction spray columns 97
Holdup in spray - extraction columns 55
Mixing of particulate solids 73
Perforated plates versus bubble caps 154
Perforated and porous plates in gas absorption 225
Perforated and bubble-cap trays efficiency 154
Performance of bubble-trays and turbogrid trays 135
Solute transfer from droplets liquid-liquid extraction 33
Year's publications on gas absorption 134
Conveying
Canned motor sealed systems 187
Elevating granular material 205
Feeding granular material to higher pressure 206
Handling beds of granular solids 186
Hydraulics, pump technology, types of pumps 15
Jacoby rotating tube is compared to screw feeder 135
Material handling for gas works 225
Gas Detectors
Electrical device to locate leaks of gases 34
Detecting gas leaks 99
Summary of leakage detection practices 217
Grinding
Lump coal and coal tar pitch materials, handling dust control 43
Heat Exchangers
Carburetted water gas cooling and condensing 43
Cast iron, recuperators for gas flow 155
Cooling and condensing on carburetted water gas plant 33
Designing condensers with both plain and finned tubes 54
Equations for transfer in cross-flow heat exchangers 54
Finside coefficients in finned-tube exchangers 114
Gas solid mixing and heat transfer 98
Heat exchanger expansion 226
High speed heating of steel 155
Low-finned tubing in heat exchangers 34
Psychrometric design of cooling towers 185
Step-wise heat transfer calculations 74
Tube and shell, liquid heat exchange 155
Piping
AGA recommended gas piping 210
Conduit expansion system and deflection joint 15
Constriction valve for fluidized solids 226
Gulf Interstate system construction operations 8, 9
Lubricated plug valves 76
Pressure relief devices 186
Pulsation absorbers 99
Pumping liquefied oxygen 135
Reactors
Acetylene by partial combustion of hydrocarbons 13
Erection techniques for large vessels 74
Fluid vessel having three stages 74
Fluidised pilot Fischer-Tropsch synthesis 130
Gasification of coal in cyclone type reactor 83
Heat and mass transport in fixed catalyst bed 74
Iron removed from coke by chlorination 61
Oxygen-hydrogen fuel cell of 2-3 kw. 152
Periodic inspection of unfired pressure vessels 115
Pebble heater production of acetylene 13
Preventing steam from condensing in fluid catalyst units 32
Quenching partial combustion decomposes diacetylene 13
Shale retorting in hydrogen 48
Pressure vessel design use alloy and carbon steels 225
Rational thickness design for pressure vessels 74
Unfired pressure vessels inspection systems 170
Use of protective gas in a powdered coal gasifier 84
Separators
Drainage times in bubble-cap columns 114
Electrified centrifugal cleaning device 185
Equilibrium calculations 73
Fractionation of mixtures in cascade, numerical calculation 206
Fractionation of mixtures in cascade, reflux ratio 206
Holdup in spray - extraction columns 55
Hydrogen separated from hydrocarbon by thermal diaphragm diffusion 135
Improved electrostatic and mechanical devices 144
Ion exchange a unit process 54
Performance of sieve and bubble-cap plates 225
Pressure affects oil and gas separation 145
Rule for pressures and number of stages 145
Separating well - stream fluids 145
Stripping towers with perforated plates 114
Uniflux fractionating trays 186
Volatility of binary mixtures from column 114
Storage
Bulk solids flow in bins 53
Estimating pressure vessels 54
Foundations for vertical vessels 171
Graphical method for sizing air receivers 151
Nomographs for pressure and vacuum vessels 135
Protect tank investments 115
Vacuum vessel design chart 135
Industrial Heating
Coke Ovens
Stirring, recovering heat and steam in char retort 43
Temperature in coke oven 193
Furnaces
Furnace for pulverized fuels 121
Direct-fired heaters, duty and application 187
Factors influencing properties of refractory concretes 16
Function, gases used, and

advantages of protective atmosphere 20
Fundamentals of gas carburizing 20
Heat treating machines 159
Insulating refractory linings in furnaces 81
Kiln processing lignite with heavy oils 142
Kilns, reduction of cooling times 228
More efficient heat exchange in rotary kilns 34
Operating variables and furnace performance 81
Porcelain enameling utilizes gas 160
Super-charged blast-furnace and gas turbine 81
Temporary furnace for stress-relieving girth weld 16
Theory of furnace gas atmospheres 20
Industrial Burners
Cyclone furnace as efficient combustor 20
Design of aerated burners 80
Flame stability on reaction rate theory 103
Gas-fired panel units for infrared heating 41
Oxy-town gas for flame hardening 176
Peat-fired power stations 20
Stabilized oxy-fuel gas burners 61
Submerged combustion equipment 20
Generators and Producers
Automatic Hasche reformer for a 675 Btu/CF gas 7
British methods for oils in gas making 142
Calcining carbonaceous materials 21
Conversion of liquid and gaseous hydrocarbons 84
Generator for dry gas 186
Koppers-Hasche reformer 179
New apparatus temperature controlled two shells 194
Rexco plant enlarged new retort 7
Seven- and eight-foot high-Btu oil gas set 142
Status of steam properties 55
Three-shell, cyclic high-Btu oil gas process 142
Vertical gasifier burner arrangements 195
Heat Pump
Design ten commercial installations 174
Dual-purpose domestic heat pump 138
Heat pump water heater 58
Heat transfer using heat pumps 58
Installation and operating costs of heat pump 159
Large volume heating load protected by gas heat pump 17
Service Plant
Halon compounds as fire extinguishing agents 15
Silica remover by monobed demineralizer 156

F

FLUID FLOW
Measurement
Analog computer type flowmeter 226
Bibliography, dynamic pressure measurement 113
Committee on gas measurement report No. 3 9
Dall flow tube 76
Effect of edge thickness on orifice coefficients 55
Flow-meter for compressible fluids 75
Gas measurement and integration clinic 88
Main flow and side-stream meter 99
Meter station facilities design 128
Line flow effiiciencies method 200
Oil-field instrumentation 99
Oil impeller-bearing wash 186
Plotting orifice coefficient data 75
Pound as unit of measure of gas 46
Pulsating-flow literature survey 97
Rounded-entrance flow meters for incompressible steady flow 76
Subsurface flow-meter 155
In Motion
Co-current two-phase flow in pipe lines 206
Diffusion coefficients of binary systems 29
Economics of water flooding 69
Evaporation of single droplets of liquids 30
Flow and storage of gas in pipe 65
Hydraulics pump technology types of pumps 15
Theory
Detonations by rapid condensation 204
Electrolytic tank flow patterns 170
Equations for flow and nonflow systems 186
Friction in flow through annular sections 170
Graphical solution for flow equation 146
Kinetics and space velocity in flow reactor 14
Performance of pattern gas or water injection 70
Resistance to flow of fluids in wells 68
Slide rule for pressure-drop problems in gas pipelines 34
Standards in working stresses in oil pipelines 146
Surface diffusion characteristics and theoretical aspects 30
Transport of momentum, mass, and heat in turbulent jets 34
FLUIDIZATION
Fuel processing
Agglomeration prevented in fluidized vessel 141
Coke from pitch in suspension 142
Defining and adjusting level of charge inside chamber 54
Fluidized distillation of oil shale with heated liquid 91
Shale preheated, partially burned by air, and devolatilized 27
Gas Manufacture
Fluid vessel having three stages 74
Fuel in suspension with reacting oxygen and steam 22
Gas from coal in two-stage water gas to methane synthesis 23
Hydrocarbons with oxygen steam reforming in fluid catalytic reactor 44
Process for gasifying coke 63
Water gas in fluidized steam-char-calcium oxide process 126
Water gassynthesized to methane by iron oxide catalyst 23
Petroleum Refining
New data on fluid coking 48
Preventing steam from condensing in fluid catalyst units 32
FRACTIONATION
Absorption factor approach to Thiele-Geddes 114
CO_2 and H_2S removed from distillation analysis 221
Cyclic process separation of air by liquefaction 97
Diolefins removed from gas stream by carbon 52
Drainage times in bubble-cap columns 114
Electric control of distillation units 90
Equilibrium calculations 73
Fractional separation in partition column 149
Integral method for petroleum distillation calculations 223
Temperature fractional distillation improvements 149
Oxygen production process and costs 170
Performance of sieve and bubble-cap plates 225
Rectification techniques for fluid mixtures 97
Slope of percent evaporated versus temperature at 10% 167
Steady state fractionation of mixtures in cascade, reflux ratio 206
Steady state fractionation of mixtures in cascade, numerical computation 206
Stripping towers with perforated plates 114
Uniflux trays, performance 186
Volatility of binary mixtures from column 114

G

GASIFICATION

Coal
- Agglomeration prevented by cooled inlet 141
- Australia black and brown coal for synthetic fuel 130
- Carbonization in British gas industry 6
- Carbonyl iron reacts with sulfur and is taken off with ash 7
- Coal gasification Louisiana, Missouri 195
- Coal to oil synthesis plant at Johannesburg, So. Africa 48
- Converting coal in water slurry to synthesis gas 177
- Fixed bed carbonization in stream of gases 141
- Fuel research board for 1954 on coal 160
- Gas production techniques in France 214
- Gas using pulverized coal and two reactors 192
- Gasification of coal, coke and oil as methods in future 125
- Gasification of coal in cyclone type reactor 83
- Gasification processes current in Germany 160
- Gasifying powdered coal suspension in slagging chamber 193
- Koppers-Totzek gasification plant at Oulu, Finland 177
- Large scale carrier-gas carbonization 141
- Process for gasifying coke, coals with ash discarded 63
- Reactions of carbon with carbon dioxide and steam 176
- Status of complete gasification processes 193
- Synthesis gas by partial combustion with oxygen 195

Coke
- Commercial carbons investigated on gasification rates 105
- Gasification in shaft-furnaces of ferro-coke 214
- Macropore structure of carbons and gasification rates 105
- Reactivity of coke with CO_2 214

Complete
- Coal gasification in fixed-bed and decaking methods 213
- Coals for complete gasification plant 215
- Gas producer plant at Le Creusot, France 213

Hydrocarbons
- Catalytic-thermal cracking of gaseous and liquid hydrocarbons 106
- Combustion of gaseous hydrocarbons injected as parallel sheets 195
- Conversion of liquid and gaseous hydrocarbons 84
- Cracking process on hematite at 1450 deg. F. 106
- 500-600 Btu gas from naphtha 178
- Fuel gas from paraffins 215
- Hydrogen from hydrocarbons by catalytic reforming 126
- Portion of liquid fuel gasified directly with oxygen 195
- *SEGAS* oil gasification plant 44
- Thermal cracking of propane, butane or natural gasolines 125
- Treating oil gas to produce utility gas 215
- Variable Btu domestic gas by thermal and catalytic cracking 125

Methanation
- Carbon gasification in hydrogen to produce methane 125
- Gas from coal in a two-stage water gas to methane synthesis 23
- Water gas synthesized to methane by iron oxide catalyst 23

With Oxygen
- Ammonia synthesis gas from cyclic and continuous generators 63
- Gasification in steam and oxygen in vertical downflow slagging generator 44
- Gasification of brown coal using Lurgi 44
- Oxygen gasification reviewed 213
- Oxygen in gasification 194
- Oxygen transfer between carbon dioxide and carbon monoxide 29
- Use of protective gas in powdered coal gasifier 84
- Preheating gas and vapor in gasification 83

With Pressure
- Gas from brown coal in Australia 84
- Gasification of British fuels by Lurgi 84
- Gasification in fixed-bed pilot Lurgi unit 23
- 102-mile Lurgi gas line built for 90 MMCF/day 178
- Lurgi pressure gasification 22
- Variables in Lurgi gasification 62

Reactions
- Carbon-steam reaction in fixed fuel bed 22
- Computations of reaction rates in powdered coal gasification 62
- Reacting fuel in suspension with oxygen and steam 22
- Steam-carbon reaction 223

Underground
- Gasification in wells in circular pattern 63
- Underground gasification in Russia, U. S., and Great Britain 84

GAS TURBINE
- Adding steam to air in the gas-turbine process 42
- Centrifugal compressors for gas pipelines 147
- Combination pressure gas producer-gas turbine power plant 123
- England to manufacture "Mars" gas turbine unit 140
- Free-piston gas-turbine 104
- Free-piston turbine prime mover 20
- Gas turbine-powered Plymouth touring 160
- Influence of some chemical and physical factors on formation of deposits 42
- Open cycle coal burning gas turbine 61
- Pressurizing, combustion, and ash separation for turbine 39
- 60-hp. 120-lb. Rover turbine 192
- Super-charged blast-furnace and gas turbine 81
- Turbines corrosion and slag deposits 28

H

HEAT TRANSFER

Apparatus and Media
- Cast iron, recuperators for gas flow 155
- Boiling-outside finned tubes 97
- Cooling water jackets of internal combustion engines 196
- Enclosed-flame radiant burner 41
- Equations for heat transfer in cross-flow heat exchangers 54
- Finned tube atmospheric coolers 97
- Furnace models to investigate heat transfer 139
- Gas-solid mixing and heat transfer 98

Theory
- Analogue prediction of the thermal behavior 138
- Heat and mass transport in a fixed catalyst bed 74
- Heat transfer for cross-flow through a tube bank 98
- Heat transfer in porous media 109
- Heat transfer problems by analogue shape factors 97
- High speed heating of steel 155
- Outside design temperature for heat load estimation 18
- Radiation analysis by network method 98
- Temperature in a coke oven 193
- Tube and shell, liquid heat exchange 155
- Turbulent heat transfer, mass transfer, and friction in smooth tubes 34

HYDROGEN

Manufacture
- Combustion of hydrocarbons with oxygen steam 44
- Converting plant's source of hydrogen from coke to reformed natural gas 62
- Hydrogen by combined thermal and diaphragm diffusion 135
- Hydrogen from hydrocarbons by catalytic reforming 126

Palladium diffusion of hydrogen 223
Reforming at West Conshohocken gas plant 212
Reactions
Combustion and hydrazyl-type of free radicals 40
Effect of flow on ignition 211
Thermal conductivities of condensed gases 52

L

LEGAL
General
Clauses in natural gas storage agreement 174
Commissions
Federal Power Commission
Activity with gas legislation 157
Consolidated Natural Gas Co. views on Harris Bill 157
Current status of independent gas producers 37
Discussion of regulation by Natural Gas Pipeline Co. of America 117
Fair field value would encourage exploration 67
FPC regulations of prices disastrous 173
Federal regulation of gas producers 209
Gas escape clause tested 77
INGAA resolution calls for amendment to Natural Gas Act 1
Independent producers who sell gas for resale are "natural gas companies" 37
Mayors asked for FPC regulation on well-head price 117
Nationalization or private enterprise; interpretation of Phillips case 77
Objections to Fulbright Bill of Brooklyn Union's president 137
Producers emphasize that regulation is unnecessary 157
Public power program no longer serves public 101
Public utility commissioners elected or appointed? 117, 157
Qualifications of federal commissioners 17, 38
Regulation of gas sales by producers must be removed 17
"Rule 174-A", commission regulation at wellhead interpretations 37
Sept. 1954 NGA discussion of Phillips case 17
Status Harris-Fulbright bill 189
Status of selling at wellhead; new FPC order 174B 37
Support for Harris Natural Gas Bill 157
Views of Consolidated Edison on escalation clauses 157
Why Wisconsin started Phillips case 58
State
"Economic waste" bill is minimum price bill 101
Professional rate agitation racket 209
Presidential Advisory Committee favors state regulation 101

LP-GAS
Conservation
LP-gas for flooding 217
Enrichment
Costs of various types of standby and peak shaving facilities 77
Vaporizing petrol by mixing with producer gas 22
Properties
Cobalt bromide moisture test for propane 92
Recovery
Hydrocarbon recovery plant in Southwest Texas 46
LP-gas storage produced increase in oil 108
Natural gasoline and LP-gas industry 46
Separators on gas condensate production 162
Temperature affects separation 162
Vapor-liquid equilibria ratios for hydrocarbons 145
Well-stream composition affects separation 162
Statistics
LP-gas sales increased over 1953 47
Petrochemicals from propane, butanes 169
Storage
Caverns offer storage by peak shaving plants 88
Cavern storage capacity for LP-gas up 73% 199
Economics of storing LP-gas 199
Effect of underground storage on price 164
Propane stored in prestressed concrete pipe 88
Safety features and recommendations in LP-gas installations 46
Salt cavern in Sarnia for LP-gas products 88
Sandstone plus sealant equals storage 146
Sealant of neoprene and silicone for cavern storage 181
Seasonal LP-gas utilized underground storage 66
Solution-cavity storage developments 199
Storing gasoline underground with water as seal 199
Vermiculite concrete fireproofing LPG tanks 46
Transmission
Cost of LP-gas bulk 180

M

MAINTENANCE
Assembly line meter repair 128
Bearings, lubricants, and lubrication 227
Card index equipment records 65
Cleaning, coating, drying procedures to internally coat pipelines 171
Coatings for exterior and interior of pipelines 171
Corrosion activities of technical societies 227
Direct corrosion activities and record control information 227
Gas plant points of potential trouble 156
Meters lifted, positioned, lowered, and submerged 15
Planned meter retirement program 66
Planning instrument maintenance and replacement 99
Power end of gas-engine-driven compressors 8
Preferred basis for meter changeouts 66
Prevention of paint failures 171
Protect tank investments 115
Three types of automatic proving devices 128
Trolley-conveyor system reduces meter repair costs 66
Warehouse design for gas industry 65

MANAGEMENT
Accounting
Keeping using and/or discarding records 173
Mass record keeping system 45
Punched card techniques on purchase and payment for natural gas 77
Cost Data
Allocating costs in gas production 173
Buying gas for pipelines 46
Comparative total costs of gas and electricity for cooking 157
Corrosion control and cost figures 172
Costs of coal, fuel oil, and natural gas 209
Cost of gas transmission and coal transport 137
Economic analysis of main sizing 180
Economics of peak shaving and storage gas 101
Economics of storing LP-gas 199
Electricity and gas equivalence in commercial kitchen 210
Field price and economic of producing send-out gas prices 101
Finding recent cost data 185
LP-gas bulk plant 180
Oxygen production process and costs 170
Problems in cost estimating pressure vessels 54
Various types of standby and peak shaving facilities 77
Economic Survey
Atomic development civilian applications 189
Comparative costs of gas and electricity 119
Detergents derived from petroleum sources 153

Energy production in India 178
Energy sources of the future 57
Energy supplies and resources policy 173
Factors affecting engineering design; market, load, storage; line size, horsepower and location 47
GAMA issues are action program, subnormal earnings and electrical competition 17
Market and distribution in Pacific Northwest 209
Petrochemicals volume too small to affect oil and gas 153
Prospect for 1955 in kitchen appliances 102
Resources for the future 36
Education
Financial aid to colleges by Pennsylvania Power and Light 17
Gas engineering at Texas A&I 37
Gas Engineering since 1900 at University of Michigan 1
LP-gas countered electric company advertising by true case 1
Penn State offers variety of fuel studies 17
Train for management at all levels 209
Training servicemen of distributors, dealers, contractors, and servicing agencies 210
Gas Industry
Agreement on supplying B.C., Wash. and Ore. 38
Alabama natural gas venture in facilities 64
Banks in gas industry financing 58
Card index equipment records 65
Competition best for gas production 101
Communities finance construction of facilities 17
Construction budgets for 1955 transmission companies 137
Costs relocate utility facilities in highways 38
Economics of supplying gas from oils 189
Gas companies in South reported higher net in 1954 158
1955 gas construction to top $1 billion 137
Gas industry in 1955 57
Gas making processes used outside of Britain 57
Incentives to expansion of gas industry 173
Meeting for producers, pipe lines and distributors 209
Fuel and power resources of Germany 194
Load factor, storage, economic and financial problem of 25
Nationalization or private enterprise 77
North Dakota reserves of 500 billion 1
Pacific Northwest pipe line key to new frontier 37
Past year's statistics on gas sales, revenues, gas reserves, construction 37
Present art of supplying peak load gases 189
Price to be index whether gas or petroleum are selected 224
Restoring service after atomic attack 127
Sell gas as a service, not fuel 173
Six-month approvals total $324 million 1
Trans-Canada gas line delayed until 1956 157
Trends and influences on the domestic load 117
Warehouse design for gas industry 65
Westcoast plans deliveries in 1956 157
Institute of Gas Technology activities
Autohydrogenation of oil gases 161
Continuously pulverizing and gasifying carbonaceous solids 193
Devolatizing coal fuel 106
Four-shell cyclic generative pressure oil gas pilot unit 126
Gas interchangeable with coke oven gas by catalytic reforming of liquid hydrocarbon 44
Petrochemicals from natural gas and natural gas liquids 134
Physical-chemical properties ethane-nitrogen mixtures 168
Reactions of carbon with carbon dioxide and steam 176
Thermal cracking of propane, butane or gasolines 125
Thermodynamic properties methane-nitrogen 95
Labor
Balance between military and productive labor force 77
Milwaukee gas employees new testing program 77
Outlook on automation by labor 173
Review of automatic technology 226
Public Relations
Campaign to inform public about gas 158
Newly built gas pipeline for filling low reservoir 37
Rates
Natural gas into Pacific Northwest will require a revision in gas load and gas rate structure 2
Portland spurns Pacific's "contract demand" offers 2
Price of gas ultimately dictated by competition 57
Research
Chemical patent service uses Uniterm 77
Dimensional systems and units in chemical engineering 206
Linear programming decisions, illustrative problems 158
Operations research: scientific management 117
World coal research in 1954 106
Safety
Analysis crude death rates 137
Code covers design, construction, operation, and maintenance of gas transmission 27
1953 fire loss chart; prove gas safest 57
Gas 18th in list of 24 causes of fire losses 57
Gas installations survive A-bomb 137
Gas well fire in Leidy Field 219
Halon compounds as fire extinguishing agents 15
LP-gas and natural gas storage, piping and appliances to A-bomb blasts 137
Leakage surveys four basic types 164
New ASA code for gas transmission piping 48
New piping code to establish maximum safety 48
Protecting distribution structures 162
Safety features and recommendations in LP-gas installations 46
Safety program of Peoples Natural Gas Co. 27
Unusual accidents in British gas works 212
Vermiculite concrete fireproofing LPG tanks 46
Statistics
International statistics of gas industry 189
IPA productive capacity report on oil capacity 166

MANUFACTURED GAS

Coal Gas
Carbonization in British gas industry 6
Gasification of British fuels by Lurgi 84
Large scale carrier-gas carbonisation 141
North Wales pipeline 126
Preheating reagents in powdered fuel gasification 83
Inert Gas
Control of furnace atmospheres 171
Dissociated ammonia atmosphere 104
Generator for dry gas 186
Inert gas generators for chemical processing 7
Nitrogen-base prepared atmospheres 104
Rise in argon output due to inert-atmosphere welding 12
Mixed Gases
Vaporizing petrol by mixing with producer gas 22
Oil Gas
Autohydrogenation of oil gases 161
British methods for oils in gas making 142
Catalytic-thermal cracking of

gaseous and liquid hydrocarbons 106
Four-shell cyclic pressure oil gas pilot unit 126
Fuel gas from paraffins 215
Gas production techniques in France 214
Hydrocarbon cracking by hematite with steam 106
Liquid fuel gasified with oxygen 195
Natural gas substitute from gas oil 62
New apparatus temperature controlled in two shells 194
Saltley Works ONIA-GEGI regenerative catalytic oil gas plant 43
SEGAS oil gasification plant 44
Seven- and eight-foot high-Btu oil gas set 142
Supplying 25% load factor domestic gas 189
Thermal cracking of propane or natural gasolines 125
Three-shell high-Btu oil gas 142
Treating oil gas to produce utility gas 215
Variable Btu domestic gas by a thermal and catalytic cracking 125
Producer gas
Combination pressure gas producer-gas turbine power plant 123
Review gas-producer practice 216
Reformed Gas
Ammonia synthesis gas from reformer off-gas 143
Automatic Hasche reformer for 675 Btu/CF gas 7
Burner for production of carbon monoxide and hydrogen 195
Catalytic reforming of liquid hydrocarbon 44
Converting plant's source of hydrogen from coke to natural gas 62
Eight Hasche gas reformers in Florida 179
Free iron and iron oxide for production of carbon monoxide 143
Girdler G-29 nickel base reforming catalyst 179
Koppers-Hasche reformer 179
Firedamp methane reforming with nickel catalyst 26
Pressure reforming of gas in ammonia synthesis 224
Reforming at West Conshohocken plant 212
Utilizing methane by diluting with inerts for interchangeability 26
Synthesis Gas
Bibliography of Fischer-Tropsch synthesis 201
Coal gasification at Bureau of Mines in vertical gasifier 195
Coal gasification at Oulu, Finland, doubled 177
Coal in water to synthesis gas 177
Equilibrium data in synthesis gas production 63
Gasification of brown coal 44
Partial combustion of coal with oxygen and steam 195
Partial combustion of hydrocarbons with oxygen, steam 44
Synthesis gas by cracking of methane 7
Unreacted coal from first reactor circulated to second 192
Water Gas
Equipment and Generators
Ammonia synthesis gas 63
Carburetted water gas cooling and condensing 43
Gasifying powdered coal suspension in slagging chamber 193
Processes
Oxygen in gasification 194
Status of complete gasification processes 193
Reactions
Fluidized steam char process of calcium oxide 126
Gasification in fixed beds pilot Lurgi unit 23
Reactions of carbon with carbon dioxide and steam 176
Water gas "blow" air at twice the rate 196
MASS TRANSFER
Absorption by short wetted-wall columns 154
Absorption and stripping design 185
Cyclonic dynamic spray scrubber 155
Designing condensers with both plain and finned tubes 54
Perforated and porous plates in gas absorption 225
Solute transfer from droplets liquid-liquid extraction 33
Transport of momentum, mass, and heat in turbulent jets 34

N

NATURAL GAS
Conditioning
City gate stabilization by air injection 85
Cooling fluid refrigeration of gas 144
Denver-Julesburg gas products plant conserve water 216
Gas separation method uses activated fluidized char 107
Low temperature separators on condensate 162
Mustang Island liquid recovery plant 64
Pressure affects oil and gas separation 145
Rule for pressures and number of stages 145
Separating well stream fluids 145
Temperature affects separation 162
Well-stream composition affects separation 162
Conservation
Fair field value would encourage exploration 67
Pressure maintenance in Venezuela 90
Texas "economic waste" bill a minimum price bill 101
Utilization of methane from coal mines 45
Cracking
Catalytic reforming plant in Buenos Aires 26
Coke from continuous coating of liquid hydrocarbon on drum 91
Dry-furnace carbon-black process 126
Dehydration
Amino-ether gas treating 199
Conditioning processes for high pressure transmission 8
Dehydrating and recovery of liquefiable hydrocarbons 64
Economics of modern gas dehydration 24
Hydrocarbon-water mixtures and use of dry dessicants 8
Methane dehydration upon adsorbents 24
Hydrates
Inhibition of hydrate formation 87
Preventing hydrogen sulfide formation 9
Interchangeability
Bibliography conversion to natural gas 45
Degree of interchangeability of various gases with coal gas 41
Gaseous fuels, properties, behavior, and utilization 96
Interchangeability of fuel gases 217
Methane reforming with nickel catalyst to produce send-out gas 26
Utilizing methane by diluting with inerts for interchangeability 26
Odorants
Leakage surveys four basic types 164
Odorants evaluated by new apparatus 93
Production
Drilling
Advances in well logging 146
Air drilling faster and more economical 197
Air drilling reduced cost of wells 65
Air, gas drilling in Appalachian area 197
Air-gas drilling reviewed 216
Air and gas drilling aided wildcat operations 65
Air volumes to obtain density reduction 197
Appalachian basin rotary rig air drilling 107
Bit loading and rpm penetration rate 107
Cleanable core barrel 180
Completing oil wells by shaped-charge tool 164
Compressed air saves drilling dollars 86
Diamond drilling with wire-

line core barrel 162
Drill faster with air 86
Drilling fluids, properties, practices 197
Drilling production and reserves for Alberta 197
Electrical rotary-percussion drill satisfactory 109
Exhaust gas boosts drilling rate 86
Extra care in completing wells 85
Instrument to evaluate drilling and logging 108
Mud practices in Southeastern New Mexico 197
Offshore drilling structures 218
Phillips tests air-mud drilling 86
Radioactivity well logging in completion 108
Rotary drilling with gas 127
Sonic earth boring drill 180
Straight hole drilling 107
Three basic rig designs 162
Turbine drilling system application 144
Using air and natural gas to drill 127
Water analyses help identify formations 65
Reservoir Engineering
Charts for bottom-hole pressure 200
Computers facilitate stratigraphic correlations 181
Directional permeability of sandstones 218
Electric log interpretation in shale 182
Electrolytic tank for flow patterns 170
Encroachment of injected fluids 165
Gas well performance curves 165
Geophysical instrumentation progress 181
Resolution reflection seismograph 67
Maimum recovery from Wild Goose field 201
Model experiments of water-drive 144
Performance determined by reservoir analyzer 165
Predicting reservoir performance 165
Production of reservoirs below bubble-point 67
Recovery and pressure gradient in water jet porous media 145
Reliability of permeability measurements 146
Review of seismic methods 181
Separator sampling of crude oil reservoirs 26
Southwest Muldoon Texas coastal field now fully developed 90
Stratigraphic research of Gulf area 91
Temperature surveys in wells 182
Tijerina recovery by gas injection 165
Welge method of relative permeabilities 109
Well Practice
Acid kinetics in limestone formations 107
Analyzing producing rate and pressure-buildup 164
Combatting corrosion in production in Kansas 198
Completion damage determined graphically 181
Corrosion of casing by earth currents 130
Direct calculation of bottom-hole pressures 147
Equipment of dually-completed wells 147
Fracturing in Canada rapidly increasing 108
Fracturing in Ohio production and storage 145
Fracturing in Rocky Mountain area 164
Fracturing rejuvenates Illinois production 145
Full-scale tester for condensate wells 8
Inhibitors prevent internal corrosion of well piping 181
Load factor, storage, economic and financial problems of production 25
Methods of perforating 108
Oil-well tubing and casing fail in tension 172
Oil well tubing and casing failures 228
Organic powders and fibers for plugging 144
Potential survey predicting protection current 181
Pozzolan cement compositions indicated better properties 198
Precautions to prevent blowouts 90
Protection for oil-well casing 198
Resistance to flow of fluids in natural wells 68
Spread of gas lift valve 87
Sulfide corrosion cracking of equipment 56
Type of joints, commonly in rock 87
Properties
Diffusion constants of paraffin hydrocarbons 133
Flow of fluid through a medium 31
Generalized activity coefficients of hydrocarbon mixture components 94
Isentropic compression of non-ideal gases 162
Isothermal enthalpy changes 72
Phase and volumetric behavior of natural gases 72
Physical-chemical properties of ethane-nitrogen 168
Prediction of viscosity of gas phase over practical range 12
Thermal conductivities of condensed gases 72
Thermal conductivity of gases at high temperature 223
Thermodynamic properties of of methane-nitrogen mixtures 95
Recovery
Acoustical velocity logger improves correlation 198
Appalachian basin important sub-Devonian tests 107
Calculating relative permeabilities 89
Differential thermal analysis method of correlating formation zones 86
Errors in gamma ray surveying 198
Fracturing at Spraberry field 163
"Frac" treatment well stimulation techniques 163
Future in Appalachian basin 198
Gas fields of Eastern Kentucky 197
Hydraulic fracturing in Permian basin 163
Identification of formations by Microlog 217
Induction logging of wells 87
Mapping of Continental Shelf by oceanography 107
Methane drainage at Haig Pit, Cumberland, N. England 194
Microanalysis of soils for hydrocarbons 46
Off-shore drilling problems reviewed 198
Oil search in Honduras 163
Possible future petroleum provinces 163
Radioactivity logging 163
Radio waves in prospecting 163
Side-wall coring for sampling subsurface 217
Spectrograph for correlation in limestone 86
Recycling
Gas injection in Opelika Field, Texas 158
First cycling plant still going 215
Injection gas into Golden Spike D-3 109
Reserves
Better seismic interpretation needed 86
Borehole camera in exploration 55
Calculating dip and strike 144
Early Paleozoic locations controlled by lithology 147
Gas, oil, and sulfur in North Dakota 127
Natural gas in New Mexico 78
1954 natural gas and liquid hydrocarbon reserves 101
Production in Cardium sand in Alberta 86
Prospects good on Williston's east flank 86
Resources for the future 36
Volumetric and the pressure-decline methods 146
Statistics
Allocating costs in gas production 173
Gas utilities new records past

year's statistics 37
L.P.G. records fall again in '54 47
1955 gas construction to top $1 billion 137
Outlook for gas industry 173
Trends and influences on domestic load in Britain 117
Storage (See Distribution—Storage)
Distribution from storage to market 146
Underground storage and gas dispatching Oklahoma Natural Gas Co. 146
Utilization, Chemicals
Acetylene
BASF process for acetylene 184
Improved yields by adding preheated hydrogen 96
Partial oxidation process produces unsaturated hydrocarbons 134
Petrochemicals from natural gas and natural gas liquids 134
Trends for acetylene from natural gas 184
Ammonia and Nitrogen Fixation
Ammonia production capacity, raw materials processes 113
Comparative schemes for ammonia from natural gas, fuel oil, coal, coke oven gas reformer gas 96
Converting plant's source of hydrogen from coke to natural gas 62
Cyanide by reacting air, gas and ammonia 224
Hydrocyanic acid by natural gas, ammonia and air over platinum 224
Hydrogen cyanide and acrylonitrile from methane 24
Pressure reforming of natural gas in ammonia synthesis 224
Hydrogen
Equilibrium data in synthesis gas production 63

NATURAL GASOLINE
Development of natural gasoline and LP-gas industry 46
Equilibrium vaporization ratio charts 128
Mustang Island liquid recovery plant 64
Natural gasoline in chemical manufacture 133
Natural gas conditioning processes 8
Optimum conditions for multistage separation 66
Water chiller in condensation of pentane 46

P

PETROLEUM
Analysis
Analytical literature 1953 to 1954 167
A.P.I. Research Project 48: sulfur in petroleum 29
Bomb-volumetric method for sulfur 50
Burner for sulfur in drip oils 94
Emission spectrographic applications to petroleum analysis 29
Equilibrium flash vaporization and ASTM distillation 112
Graphical - statistical analysis in oils research 220
Group sulfur analysis of petroleum fractions 50
Hydrocarbon and sulfur types in heavy gas oil 50
Lubricating oil hydrocarbon types identified by spectrometry 50
Mass spectrometric analysis of high saturated hydrocarbons 183
Mercaptan sulfur in hydrocarbons 70
Nitrogen compounds in petroleum 50
Quantitative spectrographic analysis of petroleum ash 93
Separation by distillation, azeotropic distillation, solvent extraction, adsorption, crystallization, molecular complex formation 29
Spectrophotometric determination of sulfides in crude oils 150
Spectrophotometric procedure for aliphatic sulfides 150
Sulfur compounds from petroleum - 94
Sulfur by lamp-method 94
TBP and Engler type distillations 70
Trace Kjeldahl nitrogen 222
Trace metals in distillates 204
Cracking
Catalytic
Catalyst poisons 147
Catalytic reforming, using platinum 202
Hydro-forming catalyst properties and poisons 131
Coke Formation
Fluid coking and fluid coke 130
Fluid coking, comparison with delayed coking 48
More new coking capacity 201
Pelletized petroleum coke by fluid process 166
Gas Making
Autohydrogenation of oil gases 161
British methods for oils in gas making 142
Catalytic reforming of liquid hydrocarbon 44
Catalytic-thermal cracking of gas and liquid hydrocarbons 106
Cracking process on hematite at 1450° F. 106
500-600 Btu gas from naphtha 178
Four-shell cyclic pressure oil-gas pilot unit 126
Saltley Works an ONIA-GEGI regenerative catalytic oil gas plant 43
SEGAS oil gasification plant 44
Seven- and eight-foot high-Btu oil gas set 142
Substitute natural gas in water gas machinery 62
Synthesis gas through partial combustion 44
Three-shell cyclic high-Btu oil gas 142
Production
Drickey-Caprock Queen trend biggest in years 183
Development of subsurface combustion drive 27
Economics of water flooding 69
Elk Basin Tensleep reservoir injection 148
First fluid coker at Carter Oil Co. 182
German reserves 464 million barrels 182
Heat transfer in porous media 109
Horizontal fractures and five-spot pattern 91
Hydrafac success in Saskatchewan 198
Interpretation of intake rate data 110
IPA productive capacity report 166
LP-gas storage produced increase in oil 108
Mechanics of reservoir secondary recovery methods 90
North Burbank Field waterflooding 182
Performance of pattern gas or water injection 70
Proper reservoir evaluation 91
Radioactive solution to determine injection distribution 110
Separation process on Alberta oil sand 182
Sonic oilwell pump 111
Surfactant influence on flood recovery 201
Refining
Crude from Wafra field in Kuwait landed in Houston 106
Electric control of distillation units 90
Extractive crystallization with urea or thiourea 148
Predict 1955 domestic demand for oil products to be up 166
Product demand on U.S. refineries in 1965 131
Chemicals
Continuous catalytic hydrogenation of oils 148
Price to be index whether gas or petroleum are selected 224
Desulfurization
Amine process acid gases capacity increased 220
Autofining process activity catalyst 166
Catalytic desulfurization 69
Cost factors with ADC process for removal of mercaptans 27
Diesel oil desulfurization at

Cody, Wy. 219
Five catalytic hydrogenation processes 110
Gasoline thiophenic sulfur compounds eliminate 167
Gulf process for upgrading crudes 147
Hydrofining high-sulfur West Texas crude oil 148
Improved cobalt-molybdenum catalyst 68
Mercaptans extracted by alkali in methanol containing alkyl phenols 27
Regeneration of caustic used for removal of H_2S and mercaptans 27
Removal of thiophenes from aromatics 167
Residua deashed filtered before hydrogenation 219
Shell "Tricklie" hydrodesulfurizer 219
Sulfur and sulphuric acid from petroleum 111
Techniques for desulfurizing petroleum 48
Fuels
Annual report Secretary Interior 1954: oil from coal and oil shale 131
Heating lines for heavy fuel oil 220
Regenerating desicant beds used for dehydrating liquids 33
Reserves
California oil geological relation and productive history 68
California tidelands 68
Geology, production about the Ellenberger 69
Jameson-Strawn sand trend 166
Resources for the future 36
Texas oil from every geological age 92
Virey-Ellenburger trend 166
Statistics
1955 domestic demand for oil 166
Oil supply and demand in Europe 69
Storage
Handling and storage of fuels 41
Transportation
Bolivia line oil pressure to drive turbine 166
Field welding of pipe lines 108
Nato pipe line system of products lines 107
Off-shore loading station in Persian Gulf 218
Oil field tubular goods modifications 109
Soil temperatures and conductivities along pipeline from Kirkuk 47

PROPERTIES

Adsorption
Adsorption of gases, assumed mechanisms 53
Adsorption of hydrocarbon mixtures on charcoal 149
Charcoal weight test for C_3+ and C_4+ 149
Chemistry of silica surfaces 133
Crystalline zeolites as adsorbants or screens 113
Surface properties of precipitated alumina 151
Air
Air receiver design 151
Analytical methods and sampling for gases, vapors and particulate matter 202
Pressure-enthalpy chart for air 151
Rise in argon output due to inert-atmosphere welding 12
Ammonia
Explosibility of wet ammonia-air mixtures 151
Flame propagation for isooctane, ammonia and mixtures 122
Carbon
Examination of coal substance 83
Gas and carbon blacks 45
Oxygen transfer between carbon dioxide and carbon monoxide 29
Reactions of carbon with carbon dioxide and steam 176
Thermodynamic studies of graphite-diamond system 51
Carbon Dioxide
Gasification of six commercial carbons with carbon dioxide 105
Macropore structure of carbons and gasification rates 105
Thermodynamic functions of carbon dioxide 204
Carbon Monoxide
Exchange reactions of carbon monoxide, carbon dioxide and oxygen 222
Mild carbon monoxide poisoning 19
Nickel carbonyl thermodynamics of formation 95
Oxidation over vanadium oxide catalyst 151
Oxygen exchange in chemisorbed carbon monoxide 222
Stability of carbon - hydrocarbon-air flames 103
Catalysts
Active hydrocarbon synthesis catalyst 110
Autofining process activity of catalyst 166
Autohydrogenation of oil gases 161
Catalyst to produce carbon disulfide 205
Dehydrogenating hydrocarbons 152
Five catalytic hydrogenation processes for desulfurization 110
Girdler G-29 nickel reforming catalyst 179
Hydro-cracking of ethane on iron catalysts 32
Liquid phase hydrogenation catalyst 148
Manganese, copper, aluminum catalyst in liquid hydrocarbon 68
Reduction of carbon dioxide with hydrogen 10
Selectively removing acetylene from ethylene gases 52
Semi-commercial Fischer-Tropsch three-phase system 201
Supported nickel, cobalt or copper catalysts 68
Synthesis catalyst less than micron 202
Synthesis start-up by pressuring with hydrogen synthesis gas 10
Vapor phase catalytic oxidation of naphthalene 52
Compressibility
Compressibility deviations for polar gases 72
Design method for vent lines 90
Intermolecular potential of neon 113
Isothermal enthalpy change for a hydrocarbon 72
Second virial coefficients of gas mixtures 219
Second virial coefficients from statistical mechanics 219
Thermodynamic properties of methane nitrogen 95
Volumetric behavior of hydrocarbon mixtures 219
Xenon in range 0° to 700° C. 113
Diffusion
Binary systems such as hydrocarbons and water in air 29
Diffusion coefficients of binary gaseous systems 169
Diffusion constants of paraffin hydrocarbons 133
Palladium diffusion membranes for hydrogen 223
Surface diffusion characteristics and theoretical aspects 30
Equilibria
Behavior of nitrogen-n-heptane, nitrogen-butane system 96
Distribution between gas and condensed phase 94
Equilibria in binary systems 95
Equilibrium vaporization ratio charts 128
Evaluation of binary vapor-liquid equilibria 168
Flash calculations on IBM card calculator 168
Integral method for petroleum distillation calculations 223
Methane - propane and carbon dioxide-propane system 95
n-Hexane in liquid phase 96
Nomographs of vapor-liquid equilibria ratios 145
Phase behavior of 10 mixtures of natural gas 72
Physical-chemical properties of ethane-nitrogen mixtures 168
Vapor - liquid equilibria binary systems 226
Gases
Fluid density, function of a frequency signal 207
Identification of airborne pollutants 148
Toxicity of isocyanates, ozone,

and oxides of nitrogen 183
Yellow-tipping characteristics of fuel gases 4
Heat Capacity
Calorimeter for specific heats of polymers 205
Differential thermal analysis of building materials 204
Nickel carbonyl, thermodynamics of formation 95
Hydrocarbons
General
Constants in Benedict-Webb-Rubin equation 169
Extractive crystallization with urea 148
Flame stability with ydrocarbon mixtures 190
Acetylene
Burning velocities of propenyl acetylene 140
Radiolysis of acetylene 223
Aromatics
Separating paraxylene from isomers 73
Vapor constants for benzene equilibrium 112
Butane
Oxidation of methane in butane mixtures 211
Ethane
Physical-chemical propertie of ethane-nitrogen mixtures 168
Rate of methane production 152
Ethylene
Ethylene compressibility factors 30
Ethylene and water are combined over phosphoric acid 13
Polyethylene by low pressure catalytic process 153
Properties, sources, methods of purification for ethylene 133
Methane
Burning velocity of unconfined turbulent flames 122
Flame-stability of inverted Bunsen burner 81
Flame velocities of hydrocarbon flames 80
Methane-air turbulent flames 192
Thermodynamic properties of methane-nitrogen 95
Vapor and liquid activity coefficients functions 94
Vapor pressures of methanes and deuteromethanes 204
Higher
Heat capacity of solid and liquid n-heptane 12
Nitrogen-n-heptane system; nitrogen-butane system 96
Nitrogen-n-heptane System 96
n-Hexane in liquid phase 96
Olefins-Higher
1-Butene-water system; hydrocarbon-water solubility data 184
Propane
Equilibria in binary systems 95
Flame propagation limits 191
Phase equilibria: methane-propane, carbon dioxide-propane system 95
Preflame reaction in propane-air 81
Preparation of CS_2 from natural gas, propane and butanes 160
Propylene
Catalytic oxidation of propylene 154
Hydrogenation of propylene reaction mechanisms 170
Hydrogen
Effects of hydrogen at high pressures on metals 172
Oxygen-hydrogen fuel cell 152
Kinetics
Carbon gasification in hydrogen 125
Computations of reaction rates in powdered coal gasification 62
High-frequency oscillators, measurement of ionizable systems 72
Kinetics of homogeneous reactions 14
Kinetics of the hydrogen-oxygen-methane system 191
Principles of diamond synthesis 51
Reaction rates in hydrocarbon combustion 191
Sample kinetics problems 186
Steam-carbon reaction 223
Metals
Design of silicon solar energy converters 152
Finishes for metal products 228
Piping failures on hydroformer 228
Saving molybdenum alloys 227
Titanium technology in mid-1954 16
Nitrogen
Thermal conductivities of condensed gases 52
Vapor pressure of nitrogen 52
Nuclear
Fission products and types of radiation 204
Permeability
Permeability gases through plastic membranes 152
Reliability of permeability measurements 146
Solubility
Carbon dioxide absorption by sealing liquid 70
Ternary systems of liquid carbon dioxide 51
Sulfur Compounds
Carbon Disulfide
Carbon bisulfide production catalyst magnesium oxide nickel 205
Hydrogen Sulfide
Calcium oxide, sulfur and water yield 30
Mercaptans
Thermal decomposition of mercaptans 14
Tars
Nature of coal tar pitch 73
Tar pitches, binder in carbon electrodes 178
Separation of asphalt into four groups 132
Thermal Conductivity
Conductivities at gas-solid interface 184
Conductivity at high temperature 223
Temperatures and thermal conductivity of ground 47
Thermal conductivities of condensed gases 52
Thermal conductivity of gases 72
Thermal conductivity for N_2, CO_2, A and CO_2-N_2 mixtures 151
Theory of thermal conductivity 184
Thermodynamic
Constants in the Benedict-Webb-Rubin equation 169
Enthalpy-temperature entropy diagram 223
Properties, hydrogen, oxygen and nitrogen 133
Vapor and liquid activity coefficients, functions 94
Vapor Pressure
Accurate vapor pressures of LiBr water solutions 139
Evaporation of single droplets 30
Reid vapor pressure of small samples 71
True vapor pressure of hydrocarbon 71
Viscosity
Fracture properties of solid materials 133
Heat transfer, mass transfer, and friction in smooth tubes 34
Viscometry of gases at high temperatures and pressures 12
Viscosity of hydrocarbon mixtures, in gas or liquid phase 12
Water
Detonations condensation shocks 204
Status of steam properties 55
Specific heat, thermal conductivity and dynamic viscosity for water 152

PURIFICATION

Ammonia Removal
Ammonia removed gas by cation exchange 168
Ammonia from air by monoammonium phosphate 168
Coal chemicals at Staatsmijnen 141
Benzene
Vapor constants for benzene equilibrium 112
Carbon Dioxide Removal
Absorption in ammonia solution 97
Dehydration
Dehydrating gas and recovery of liquefiable hydrocarbons 64
Dew points gas-glycol systems 196
Gas dehydration today 196

Glycol-amine solutions deterioration 35
Methanol requirements to prevent hydrates 87
Dust Removal
Air and gases filtering and adsorption element 87
Chamber with internal baffles and water sprays 45
Clean compressed coke-oven gas on French gas line 25
Cyclone type separator for hot solids 62
Cyclonic and dynamic spray scrubber 155
Effects of pipeline dust on equipment 87
Electrified centrifugal cleaning device 185
Filter screens particles from natural gas 87
Fly ash in effluent gases burning pulverized coal 33
High velocity electrostatic cleaner 185
Hot gas cleaning by electrostatic precipitation 140
Improved electrostatic and mechanical devices 144
Natural gas pipeline deposits 89
Paris conference on gas cleaning 197
Pipe line deposits, causes and cures 129
Principles of electrostatic precipitation 144
Removal of fly-ash by continuous cyclone 140
Removal of particles by centrifugal and electrical forces 25
Removing an alkaline dust 14
Separator for dust carrying gases 8
Water-sprayed small-size cyclone dust separator 45
Gases
Cooling and condensing water gas 33
Diffusion separation of hydrogen 135
Eliminating oxygen by washing with ammoniacal cuprous compound 34
Review of absorption and humidification 134
Hydrocarbons Removal
Adsorption by fluidized active char 107
Condensate extraction from lean gas 46
Cooling fluid refrigeration of gas 144
Diolefins removed from gas stream by carbon 52
Hydrocarbon recovery plant for Southwest Texas 46
Mustang Island liquid recovery plant 64
Natural gasoline and LP-gas industry 46
Optimum conditions for multistage separation 66
Removing acetylene from ethylene gases 52
Hydrogen Sulfide Removal
Catalytic Processes
Carbonyl iron reacted with sulfur, taken off with ash 7
React H_2S and SO_2 to produce colloidal elemental sulfur 14
Sulfur and H_2SO_4 production 63
Dry (Oxide)
Different oxides at Saltley 195
Hydrogen sulfide removal using iron oxide 215
Pyrites cinders in gas purification 161
Sulfur removal by dry methods 25
Transportation of bog ore 143
Removal of H_2S by iron oxide 25
Liquid Reactants
Amine process acid gases capacity increased 220
Amino-ether gas treating 199
Condenser for recovery of sulfur 143
Conditioning processes for high pressure transmission 8
Disposal of hydrogen sulfide in refining operations 135
Girbitol process trouble spots 217
H_2S by liquid purification and recovery 25
MEA degradation products 128
Preventing hydrogen sulfide hydrate formation 9
Purification and sulfur recovery 215
Recovery of sulfur from H_2S gases 120
Removing acidic constituents including H_2S 25
Shell's natural gasoline and sulfur plant 25
Simultaneous H_2S-ammonia removal methods 125
Sulfate liquors, recovering values from coke oven gas 199
Sulfur from oil in Canada 195
Nitrogen Removal
Nitrogen by total liquefaction 66
Thermodynamic properties of methane-nitrogen mixtures 95
Organic Sulfur Removal
Carbonyl sulfide removed from hydrocarbon gases by anion exchange resin 194
Organic sulfur removal by catalysis 25
Removal of thiophenes from aromatics 167
Thiophene converting process 147
Thiophenic sulfur compounds eliminated with hydrogen alumina catalyst 167
Plant Wastes Purification
Plant for complete treatment of gas liquor 21
Treatment of spent liquor and retort house liquor 226
Tar Removal
Improved tar from coal carbonization 7
PYROLYSIS
Coal
Aromatic carbon fraction, specific gravity and volatile matter 6
Char coking at rate of 37 to 61 lbs. per sq. ft. per hour 43
High temperature reactions of coal minerals 83
Mechanism of softening and decomposition 177
Modifications in structure in range of 400-550° C. 124
Review of coal and shale pyrolysis 212
Higher Hydrocarbons
Saltley Works, ONIA-GEGI regenerative catalytic oil gas plant 43
Thermal degradation of polymers 53
Natural Gas
Acetylene by partial combustion of hydrocarbons 13
Ammonia synthesis gas from reformer off-gas 143
Catalytic reforming of liquid hydrocarbon 44
Decomposition of ethane into methyl radicals 152
Free iron: iron oxide catalyst for production of carbon monoxide 143
Pebble heater production of acetylene 13
Quenching partial combustion acetylene decomposes diacetylene 13
Oil Shales
Distillation of oil shale in preheating, distillation and combustion zone 91
Oil from oil shale by heating fixed bed with carrier gas 111
Shale feed fluidized in contact with spray of molten lead 91
Shales retorted with hot gas by cracking recovered oil 91
Synthetic liquid fuels: oil from oil shale 131
PYROMETRY
Instrumentation for atmosphere analysis and control 171
Nickel-molybedenum thermocouple 15

R

RESIDUALS
Ammonia
Chemical industry of Staatsmijnen 141
Composition of ammoniacal liquor 49
Sulphate liquors for recovering values from oven gas 199
Sulfur
Natural gasoline and sulfur plant at Jumping Pound, Alberta 25
React H_2S and SO_2 to produce colloidal elemental sulfur 14
Recovery of sulfur from a gas without production of fog 143

Refinery sulfur recovery aids pollution control 135
Shell Oil Canada two sulfur plants at Jumping Pound 195
Simultaneous H_2S-ammonia removal methods 125
Sulfur and sulphuric acid from petroleum 111
Sulfur and H_2SO_4 production 63
Tar
Nature of coal tar pitch 73
Non-irritating coal tar pitch 188
Pitches binder in electrodes 178
Treatment of coal distillation gases and vapors 7

S

SHALE OIL
Analysis
Elution chromatography shale oil assay 71
Separation techniques high-boiling shale-oil 93
Production
Crushed shales preheated by hot end-products 91
Fluidized distillation of oil shale 91
Heating shale with high-velocity carrier gas 111
Preliminary, preheating distillation and a combustion zone for shale 91
Review of coal and shale pyrolysis 212
Shale preheated, partially burned by air, devolatized 27
Shale retorting in hydrogen 48
Synthetic liquid fuels, part II, oil from oil shale 131
Refining
Cracked shale-oil gasoline stabilization by antioxidants 111
Hydrogenation improves shale oil refinability 27
Shale oil contacting with hydrogen and nickel sulfide catalyst 10

STEAM GENERATION
Fuel economy
Advantages of the cyclone combustor 20
Coal-fired turbine-electric locomotive 176
Cooling and condensing system on carburetted water gas plant 33
Fissioning with oil burning power plant 140
Horizontal cyclone furnace 210
Peat-fired power stations 20
Research on fuels, Babcock and Wilcox 139
Water Treatment
Chemical treatments in controlling corrosion 208
Water treatment for steam boilers 208

SYNTHESIS
Acetylene
Acetylene by partial combustion of hydrocarbons 13
Acetylene using preheated hydrogen 205
Continuous monitoring mass spectrometer in Wulff Process 31
Conversion of natural gas to acetylene 205
Future trends for acetylene production 184
Improved acetylene production (burner) 205
Improved yields of acetylene by preheated hydrogen 96
Partial oxidation process to produce unsaturated hydrocarbons 134
Pebble heater production of acetylene 13
Processes and results for production of acetylene from natural gas liquids 134
Quenching the partial combustion acetylene decomposes diacetylene 13
Separation of acetylene by dimethylformamide 205
From Acetylene
Acetylene polymerization, by tritium beta-particles 223
Conversion acetylene to acetaldehyde 205
Alcohols and Aldehydes
Ethanol by hydration and ethylene 13
Improved yields of alcohols from carbonylation 96
Ammonia & N_2 Fixation
Ammonia manufacture in United States 113
Ammonia manufacture several raw materials 96
Ammonia synthesis gas from catalytic reformer off-gas 143
Conversion of ammonia to hydrogen cyanide 224
Hydrogen cyanide and acrylonitrile from methane 24
HCN by natural gas, ammonia and air over catalyst 224
Natural gas raw material produces acetylene, ammonia, hydrocyanic acid 13
Nitrogen military and petrochemical uses 25% of total 113
Reforming of natural gas in ammonia synthesis 224
Synthetic ammonia and urea plant 133
Aromatics
Catarole process liquid product aromatic and gas yield olefinic 31
Petrochemical field profitable to small refiner 185
Separating paraxylene from isomers 73
Sodium sulfonated dodecyl benzene detergents, or syndets 73
Synthetic detergents from petroleum 153
Butadiene
Keener competition expected in synthetic rubber 134
Sale of 24 rubber plants, for $310 million 96
Unsaturated hydrocarbons from unsaturated ketones 32
From Coal & Coke-Oven Gas
Chemical industry of Staatsmijnen 141
Gas from brown coal in Australia 84
Recovery of H_2S, HCN, pyridines, and benzole 123
From Ethylene
Ethylene oxide by partial oxidation 13
Petrochemicals, ethane, propane 169
Properties, sources, purification and reactions for ethylene 133
Fischer-Tropsch
Active synthesis catalyst 110
Australia black and brown coal for synthetic fuel 130
Bibliography of the Fischer-Tropsch 201
Catalytic reduction of carbon dioxide with hydrogen 10
Coal to oil synthesis plant at Johannesburg, S. Africa 48
Fluidised pilot Fischer-Tropsch synthesis 130
Hydro-cracking of ethane on iron catalysts 32
Manganese, copper, aluminum catalyst 68
Oil from coal and shale 131
Removal of exothermic heat during oil-circulation Fischer-Tropsch Synthesis 10
Semi-commercial Fischer-Tropsch three-phase system 201
Synthesis catalyst less than one micron 202
Synthesis start-up by pressuring with hydrogen, then synthesis gas 10
Synthesis by fluid nickel-chromium-kaolin catalyst 7
Hydrocarbons
Dehydrogenating 2-to-8-carbon hydrocarbons 152
Houdry dehydrogenation process for butenes, isobutenes butadiene 32
Hydrogenation
Alcohols still bottoms recycled and blended with feed 96
Hydrogenation of propylene 170
Hydrogen Sulfide
Dimethyl sulfoxide from methanol and H_2S 53
From Methane
Natural gas raw material for acetylene, ammonia 13
Oxidation process yields acetylene 134
Petrochemicals from natural gas liquids 134
Motor Fuels
Alloy catalyst in preparation of liquid hydrocarbon 68
Fluidized synthesis pilot plant 130
Synthetic liquid fuels, 1954 131
Olefins
Phillips Petroleum plans for for 145,000,000 pound polyethylene plant 153

Polyethylene ready for boom 154
Shell Chemical Co. plant to synthesize glycerine 154
Oxidation
BASF process for partial oxidation natural gas 31
Partial combustion process for acetylene 184
Vapor phase catalytic oxidation of naphthalene 52
From Petroleum
Market of LP-gas and natural gasoline 133
Petrochemicals volume too small to affect oil and gas 153
Production of sulfonated dodecyl benzene 73
Price to be index whether gas or petroleum selected 224
Works of Imperial Chemical Industries at Wilton and Billingham 153
Phenol
Hercules Higgins plant produces phenol and acetone 153
Phenol from isopropyl benzene peroxide 224
Six processes for manufacture of phenol 32
Sulfur Compound
Preparation of CS_2 from natural gas, propane and butanes 169
Catalyst to produce carbon disulfide 205
Synthesis Gas
Burner for the production of carbon monoxide and hydrogen 195
Combustible gases from liquid fuels with oxygen 195
Converting coal in water to synthesis gas 177
Demonstration plant gasification unit modifications 195
Free iron: iron oxide selectivity for production of carbon monoxide and hydrogen 143
Kinetic study of the steam-carbon reaction 223
Oxygen for gasification of coals 213
Partial combustion coal with oxygen and steam 195
Reactions of carbon with carbon dioxide and with steam 176

U

UTILIZATION
Air conditioning
Air conditioning, gas engine units 174
Air conditioning noise control 102
Air handling systems for conditioning multiroom buildings 19
Amana air conditioner features 118
Better refrigerant piping for parallel compressor systems 5
Behavior of solid adsorbents in dehumidifiers 119
Coleman Co. air conditioning systems using gas fuel 138
Compression type refrigeration system is increased by adding sorbent cycle 2
Evaporative condenser in air conditioning 175
Evaporative cooling in humid areas 118
Gas-powered summer air conditioner 138
High temperature psychrometric chart 119
Humidity changer for air-conditioning 78
Large volume heating load protected by gas heat pump 17
Panel cooling for residence 120
Residential air conditioner conference 78
Steam jet refrigeration 190
Temperature, mass and heat transfer in treating air 118
Texas boom in all-year air conditioning with gas 2
Turbine-drive and compressor-drive compression refrigeration 102
Ventilation of commercial laundries 21
Weather data analysis for cooling system 139
Domestic
Clothes drying
Developing the washer-dryer 102
Sales of gas-fired clothes dryers 78
Try it, buy it, sell gas dryers 39
Incinerators
Designing successful incineration units 59
Gas incinerator characteristics 3
Cooking
Comparative costs of gas and electricity 119
Cooking range 39
Costs of gas versus electricity in kitchens 210
Electricity cooking replacement with LP-gas 102
Handbook of kitchen design 103
New features of electric ranges 158
Swing Magic Chef, Inc., back towards gas cooking 138
Top burner thermostatic control 190
House Heating
Analogue prediction of thermal behavior 138
Brosché method of anticipating degree-days 158
Chicago's Navy Pier heating problem 18
Combustion type air heater 175
Comparative efficiencies, coal, oil, gas 4
Conversion to gas-oil firing 139
Costs for gas and electric space heating 159
Data book on sales and installation 38
Dealer's "heating institute" 174
Degree days by instrument 121
Dual-purpose domestic heat pump 138
Efficiency of gas over oil for heating 80
Efficiency tests on oil burners 174
Evolution of hot water systems 119
Fuel burning space heater 175
Gas Furnace 175
Gas heating to increase 102
Heater, floor and wall 175
Heat-loss estimating methods 175
Heat pumps design of ten commercial installations 174
Heating season on gas and oil fired heating installations 18
How Rochester builds load with gas heat 18
Incidence of solar and sky radiation 79
Los Angeles use of modern, dual-fuel burner 3
Maintaining constant relative humidity 139
Meet oil heating competition on efficiency 175
Outside design temperature for heat load estimation 18
Pressure hot water in space and process heating 79
Radiant hot-water heating panels 119
Reflective radiant conditioning 58
Sales aid toward "house heating" 119
Schwank radiant heaters for out-door 212
Sell gas as a service, not a fuel 173
Survey figures show gas was actually less expensive than oil 39
Trapping and manifolding steam and condensate 138
Trends and influences on domestic load (British) 117
Valance heating and cooling system 103
Weather in air conditioning 189
Winter design temperatures for Canada 138
Water Heating
Gas heaters 175
Gas vs. oil in water heating 80
Heat pump water heater 58
Heat transfer using heat pumps 58
Heater for stock watering tanks 175
High speed electric water heater 159
Potential sales of water heaters 159
Renting automatic storage-type water heaters 19
Sales potential and proper

determination of water-heater size 190
Size and install gas water heaters 103
Water heater rental, favorable aspects 190
Water heater rental plan successful 120
Industrial
Drying
Efficiencies with steam, gas burners, or electricity in drying 4
Heating
Agricultural flaming balanced market for LP-gas 105
Building an off-peak and fringe load 67
Ceramic artware drying and firing 61
Fissioning with oil burning power plant 140
Flame geometry aids heat processing 192
Flow process charts for heat-processing 104
Furnace models to investigate heat transfer 139
Gas-fired duct heaters remoered make-up air 82
Gas-fired panel for infrared heating 41
Gas heat in ladle heating, pipe bending and heat treatment 140
Gas in sugar confectionery 4
Heat applications in processing textiles 61
Heat processing combustible material 105
Heat treating machines for automatic heating of bar 159
Heated solution tanks market for LP-gas 82
Heating applications at Crane Co. 105
Hot water for large volume needs 4; 60
Kiln with temperature zones for ceramic 121
L.P. gas for curing tobacco 160
L.P. gas to fire flame cultivator 159
LP-gas four poultry raisers 61
Malting process heat requirements 176
How McLaughlin roasts coffee 121
Metal finish baking with gas 212
Metal melting, using LP-gas 105
Porcelain enameling utilizes gas 160
Pottery ware kiln radiant-heated 61
Refractory design in rotary kiln 105
Research on fuels, carbon steel, cyclone furnaces, and refractory fiber 139
Sintering clay aggregate 191
With growth of automation prospects for gas are bright 42
Refrigeration
Absorption refrigeration in which solar energy is used 3
Coleman Company gas motor unit 158
Electrical-analog applied to refrigerating-plant performance 139
New concept wall refrigerator 175
Refrigerant liquid traps prevent recirculation 190
Refrigeration heat exchanger with liquid seal 59
Steam-jet refrigeration 190
Vapor lift of generator in absorption refrigerator 18
Vapor pressures of LiBr water solutions 139
Metallurgical
Carburization
Fundamentals of gas carburizing 20
Oxy-town gas plant for flame hardening 176
Protective atmospheres in industrial process furnaces 20
Theory of furnace gas atmospheres 20
Heat Treatment
Ammonia and hydrogen atmospheres for sintering 82
Dissociated ammonia atmosphere 104
Equilibrium heat treating in controlled atmospheres 42
Foundry and other metal melting 123
Galvanized by gas kettles 61
Gas heating process for aluminum coating 60
Gas in steel-ladle heating and pipe bending 123
Heat treating costs using ammonia 5
Induction heating of large steel sections 5; 104
Insulating refractory linings in forge furnaces 81
J & L seamless tubes, quench and temper 61
Metal finish baking with gas radiant 212
Nitrogen-base prepared atmospheres 104
Parts up to 100 tons heat-treated in car-type furnace 5
Radiant heating for die blocks 212
Rapid melting of brass 5
10-ton holding furnace 5
Ore Reduction
Agglomerates by forming "green" compacts of iron ore with fuel 42
Smelting iron ore with anthracite 192
Motor Fuel
Exhaust from intermittent pulse jet 192
Gas for running-in car engines 154
Moisture addition to prevent detonation 210

W

WATER
Corrosion control in sea water coolant 35
Design of forced draft towers 185
Dissolved oxygen in water 221
Improvements in Karl Fischer method 112
Liquor effluent treatment plant 21
Physical properties of water 152
Silica remover by monobed demineralizer 156
Steam boilers, hardness and corrosion 208
Treatment of spent liquor and retort house liquor 226
Variables corrosion by water 188

INSTITUTE OF GAS TECHNOLOGY
RESEARCH BULLETIN SERIES

No. 1 STORAGE OF NATURAL GAS AS HYDRATE, by J. D. Parent, 1948 (January). $2.50

No. 2 EQUILIBRIUM COMPOSITIONS AND ENTHALPY CHANGES FOR THE REACTIONS OF CARBON, OXYGEN AND STEAM, by J. D. Parent and S. Katz, 1948 (January). $10.00

No. 3 SUPPLYING HOUSEHOLD HEATING SERVICES BY HIGH TEMPERATURE CIRCULATING LIQUIDS AND VAPORS, by E. F. Davis, J. J. First and R. E. Peck, 1948 (January). $2.50

No. 4 CRACKING CATALYST ACTIVITY IN THE PRESENCE OF HYDROGEN SULFIDE, by H. A. Dirksen, H. R. Linden and E. S. Pettyjohn, 1953 (February). $3.50

No. 5 IDENTIFICATION AND DETERMINATION OF ORGANIC SULFUR IN UTILITY GASES. *In preparation.*

No. 6 PILOT PLANT CATALYTIC GASIFICATION OF HYDROCARBONS, by C. H. Riez, P. C. Lurie, C. L. Tsaros and E. S. Pettyjohn, 1953 (July). $5.00

No. 7 GASIFICATION OF COAL IN SUSPENSION AT ATMOSPHERIC PRESSURE. *In preparation.*

No. 8 EQUILIBRIUM MOISTURE CONTENT OF NATURAL GASES, by R. F. Bukacek, 1955 (November). $3.00

No. 9 SELECTION OF OILS FOR CARBURETED WATER GAS, by E. S. Pettyjohn and H. R. Linden, 1952 (March). $4.00

No. 9 Supplement. Nomographs from Bulletin No. 9 reproduced in large scale, 22″ × 31″, $1.50

No. 10 SULFUR POISONING OF NICKEL CATALYSTS, by C. H. Riesz, H. A. Dirksen and W. J. Kirkpatrick, 1951 (September). $2.50

No. 11 EXPANSION BEHAVIOR OF COAL DURING CARBONIZATION, by O. P. Brysch and W. E. Ball, 1951 (October). $5.00

No. 12 SELECTION OF OILS FOR HIGH-BTU OIL GAS, by H. R. Linden and E. S. Pettyjohn, 1952 (April). $5.00

No. 12 Supplement. Nomographs from Bulletin No. 12 reproduced in large scale, 22″ × 31″, $1.50

No. 13 MEASUREMENT OF GAS LAW DEVIATIONS WITH BEAN AND BURNETT APPARATUS, by O. T. Bloomer, 1952 (May). $2.00

No. 14 VOLUMETRIC ANALYSIS OF FUEL GASES. *In preparation.*

No. 15 SPRAY COOLING AND SCRUBBING OF GASES. *In preparation.*

No. 16 FLUID GASIFICATION OF OIL, by J. M. Reid, W. J. Merwin, C. G. von Fredersdorff, H. R. Linden and E. S. Pettyjohn, 1953 (November). $5.00

No. 17 PHYSICAL-CHEMICAL PROPERTIES OF METHANE-NITROGEN MIXTURES, by O. T. Bloomer and J. D. Parent, 1952 (April). $3.50

No. 18 THERMODYNAMIC PROPERTIES OF NITROGEN, by O. T. Bloomer and K. N. Rao, 1952 (October). $3.50

No. 18 Supplement. "Mollier Chart for Nitrogen" and "Compressibility Chart for Nitrogen" from Bulletin No. 18 reproduced full scale (grid 10 × 10 to the inch). Each chart printed on heavy paper, 22″ × 34″; sold as set only (two sheets), $3.50 per set

INSTITUTE OF GAS TECHNOLOGY
RESEARCH BULLETIN SERIES

(Continued)

No. 19 REACTIONS OF CARBON WITH CARBON DIOXIDE AND WITH STEAM, by C. G. von Fredersdorff, 1955 (May). $7.50

No. 20 IMPROVEMENT OF NICKEL CRACKING CATALYSTS, by C. H. Riesz, H. A. Dirksen and W. J. Pleticka, 1952 (October). $3.50

No. 21 THERMODYNAMIC PROPERTIES OF METHANE-NITROGEN MIXTURES, by O. T. Bloomer, B. E. Eakin, R. T. Ellington and D. C. Gami, 1955 (February). $3.50

No. 21 *Supplement.* "Mollier Chart for Methane" and "Temperature-Entropy Chart for Methane" from Bulletin No. 21 reproduced full scale (grid 10 x 10 to the inch and 10 x 10 to 0.75 in. respectively). Each chart printed on heavy paper, 22" × 34"; sold as set only (two sheets), $3.50 per set

No. 22 PHYSICAL-CHEMICAL PROPERTIES OF METHANE-ETHANE MIXTURES, by O. T. Bloomer, D. C. Gami and J. D. Parent, 1953 (July). $3.50

No. 23 VISCOSITIES OF NATURAL GAS COMPONENTS AND MIXTURES, by N. L. Carr, 1953 (June). $5.00

No. 24 INTERCHANGEABILITY OF HIGH-BTU OIL GASES AND NATURAL GASES, by E. F. Searight, H. R. Linden, D. L. Nicol and E. S. Pettyjohn, 1956 (January). $5.00

No. 25 AUTOHYDROGENATION OF OIL GASES, by H. A. Dirksen, H. R. Linden and E. S. Pettyjohn, 1955 (March). $5.00

No. 26 PHYSICAL-CHEMICAL PROPERTIES OF ETHANE-NITROGEN MIXTURES, by B. E. Eakin, R. T. Ellington and D. C. Gami, 1955 (July). $5.00

INTERIM REPORTS

A STUDY OF FORCED COMBUSTION FOR DOMESTIC COOKING, by E. F. Davis, 1950 (August). $2.50

INTERCHANGEABILITY OF OIL GAS AND NATURAL GAS, by D. L. Nicol, R. A. Brown and H. R. Linden, 1952 (May). *Withdrawn; superseded by Research Bulletin No. 24*

PREVENTION AND RESOLUTION OF TAR EMULSIONS IN HIGH-BTU OIL GAS PRODUCTION, by H. R. Linden and R. Parker, 1953 (January). $2.50

IMPROVEMENT OF OIL GAS SUBSTITUTABILITY FOR NATURAL GAS BY PRESSURE GASIFICATION, by D. L. Nicol, J. J. Guyer, E. F. Searight and H. R. Linden, 1953 (February). $2.50

PRODUCTION OF NATURAL GAS SUBSTITUTES BY PRESSURE HYDROGASIFICATION OF OILS, by H. R. Linden, J. J. Guyer and E. S. Pettyjohn, 1954 (January). $2.50

PRODUCTION OF HIGH-BTU OIL GASES FROM CRUDE SHALE OILS, by E. B. Shultz, Jr., J. J. Guyer and H. R. Linden, 1954 (February). $2.50

A limited number of copies of Research Bulletins and Interim Reports are available for free distribution to Associate Members of the Institute of Gas Technology. Address requests to The Director, Institute of Gas Technology, Technology Center, Chicago 16, Illinois

THE GAS INDUSTRY'S OWN EDUCATIONAL AND RESEARCH FACILITY